Upgrade of Storm Water System
Environmental Assessment

Langley Air Force Base, Virginia

U.S. Air Force
Air Combat Command
1st Fighter Wing

May 2003

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAY 2003		**00-00-2003 to 00-00-2003**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Upgrade of Storm Water System Environmental Assessment Langley Air Force Base, Virginia	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Science Applications International Corporation (SAIC),22 Enterprise Parkway Suite 200,Hampton,VA,23666**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**103**	

ACRONYMS AND ABBREVIATIONS

ACC	Air Combat Command
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
AFB	Air Force Base
AFI	Air Force Instruction
Air Force	United States Air Force
AQCR	Air Quality Control Region
AST	aboveground storage tank
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CZMA	Coastal Zone Management Act
dB	decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FW	Fighter Wing
FY	Fiscal Year
HRSD	Hampton Roads Sanitation District
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
P.L.	Public Law
PM_{10}	particulate matter equal to or less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 micrometers in diameter
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TOC	Total Organic Carbon
TPH	total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
USC	United States Code
USDCESA	United States Department of Commerce, Economics, and Statistics Administration
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
VDEQ	Virginia Department of Environmental Quality
VPDES	Virginia Pollutant Discharge Elimination System

FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE

NAME OF THE PROPOSED ACTION

Upgrade of Storm Water System at Langley Air Force Base (AFB), Virginia

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Langley AFB proposes to construct a new storm sewer system to alleviate the flooding along the flightline and in the hangar area along Danforth Avenue. Additionally, the project proposes building a new pump station to discharge the collected runoff into the Back River. The new storm water system would be designed to handle the 10-year, 1-hour rain event. This Environmental Assessment (EA) analyzes the impacts associated with construction and operation of the proposed action alignment, the Northeast Outfall alternative, and the no-action alternative.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Proposed Action and Northeast Outfall Alternative: This EA provides an analysis of the potential environmental consequences associated with the proposed action and alternatives. Nine resource categories received thorough evaluation to identify potential environmental consequences. As indicated in Chapter 4.0, none of the alternatives would result in significant impacts to any resource area.

Land Use Resources: Construction of the upgrades to the storm sewer system with the proposed action or Northeast Outfall alternative would be consistent with base plans and with the goals of the Coastal Zone Management Act. Storm water standard construction practices would be included in the project construction to reduce the potential for soil erosion into the Chesapeake Bay watershed. No conflicts with existing on-base land uses would result from the construction at either site. Under the proposed action, on base roads would be closed temporarily and certain parking spaces would be unavailable with the construction of storm sewer along Danforth Avenue and Andrews Street and across Sweeney Boulevard. If the Northeast Outfall alternative were chosen, then Ward Road would require temporary closure. In all cases, the contractor would provide signage and detours to maintain access to this area for base personnel.

Socioeconomics and Environmental Justice: Construction activity, employment, and earnings associated with the proposed action and the Northeast Outfall alternative would be very similar. No adverse environmental consequences would be expected. Construction and operation of the upgrades to the storm sewer system would not create any disproportionately high and adverse health and environmental effects on low-income and minority populations on base or in the vicinity of Langley AFB.

Cultural Resources: Construction activities are not expected to impact cultural resources at the proposed action or the Northeast Outfall alternative locations. Both areas have been inventoried for archaeological resources and no significant resources have been identified. No significant architectural resources have been identified at the proposed action or alternative areas, although construction would take place in the Langley Field Historic District and consultation with the State Historic Preservation Office has been initiated.

Biological Resources: Construction activities would have no adverse effects to individual species or native plants or animals at either location since the only plant or animal species likely to be displaced from this marginal habitat are individuals of common and locally abundant species. No jurisdictional wetlands would be affected by the proposed action. Construction of the Northeast Outfall alternative has the potential to affect less than 1 acre of jurisdictional wetlands. Therefore, as a component of the alternative, wetlands would be developed in accordance with a mitigation plan approved by United States Army Corps of Engineers (USACE). No threatened, endangered, or special species/communities would be adversely affected by the proposed action or the Northeast Outfall alternative. Incidentally occurring listed, proposed, or candidate species are not likely to be adversely affected because no critical habitat exists on Langley AFB. The area to be disturbed is of low ecological value and bald eagles do not use Langley AFB for nesting or other critical life cycle functions.

Water Resources: Construction and operation of the upgrades to the storm sewer system at the proposed action site would not be expected to significantly affect the water quality of the Back River and Chesapeake Bay. While construction of the upgrades to storm sewer under the Northeast Outfall alternative would improve drainage along the flightline, flooding would still occur along Danforth Avenue. The majority of Langley AFB, including both alignments, is located within the 100-year floodplain. There is no practicable alternative, however, that would not involve construction in the floodplain. No adverse environmental consequences are anticipated from the construction with either alternative.

Air Quality: Construction-related air emissions would be generated both on base and within the region with the hauling of fill material to the base and other earth-moving activities. These emissions would be less than one percent of emissions in the Hampton Air Quality Control Region. Langley AFB is located in a maintenance area for ozone; however, the proposed action would not contribute ozone-related emissions above United States Environmental Protection Agency established *de minimis* levels for ozone. Therefore, a formal air quality conformity determination is not required.

Hazardous Materials and Waste Management: Construction of the upgrades to the storm sewer system under either alternative would have the potential to disturb portions of various Environmental Restoration Program (ERP) sites. The Langley AFB ERP Manager would coordinate a waiver from ACC policy concerning construction disturbances on ERP sites. Waivers would identify the appropriate control measures that would be necessary for the activities at the ERP sites and no long-term adverse environmental consequences are

anticipated. No appreciable hazardous waste generation is expected with the operation of the new pumping station.

Safety: Construction of the upgrades to the storm sewer system under either alternative would increase safety risks during the construction phase, however these risks would be reduced with implementation of standard construction safety practices. No adverse environmental consequences are anticipated.

Noise: Construction of the upgrades to the storm sewer system at either site would have temporary, localized noise effects during the construction phase. These localized noise increases may disrupt base personnel in nearby structures, however, the noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant.

No-Action Alternative: Under the no-action alternative, upgrades to the storm water system servicing the flightline and Danforth Avenue would not be installed. Flooding would continue to occur along these two areas.

CONCLUSION

Based on the findings of the EA, no significant impact is anticipated from implementation of either the proposed action or the no-action alternative. If the Northeast Outfall alternative is chosen, no significant impacts would be anticipated as long as any affected wetlands are replaced in accordance with the requirements identified by the USACE. Therefore, issuance of a Finding of No Significant Impact (FONSI) is warranted, and an environmental impact statement is not required. Pursuant to Executive Order (EO) 11988 and EO 11990, the authority delegated in Secretary of the Air Force Order (SAFO) 791.1, and taking the above information into account, I find that there is no practicable alternative to this action and that the proposed action includes all practicable measures to minimize harm to floodplain environments.

Bruce A Wright

BRUCE A. WRIGHT
Lieutenant General USAF
Vice Commander, Air Combat Command

30 MAY 03

DATE

EXECUTIVE SUMMARY

This Environmental Assessment (EA) describes the potential environmental consequences resulting from a proposal to upgrade the storm water sewer system servicing the flightline area at Langley Air Force Base (AFB), Virginia.

ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA has been prepared by the United States Air Force (Air Force), Air Combat Command (ACC) and the 1st Fighter Wing (FW) in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA, and Air Force Instruction (AFI) 32-7061 (*The Environmental Impact Analysis Process* (EIAP), as codified in 32 Code of Federal Regulations [CFR] 989).

PURPOSE AND NEED FOR ACTION

The purpose of this action is to upgrade the storm water sewer system that provides service to the flightline area at Langley AFB and discharges to the Back River through the base's Virginia Pollutant Discharge Elimination System (VPDES) outfall number 7.

The existing storm sewer is highly susceptible to tidal influences and modeling indicates that it does not meet current design criteria. Most of the system should be designed to carry the 10-year, 1-hour storm event without surcharging the manholes and inlets in the system. About 75 percent of the system's structures do not meet this requirement. Regular flooding has been reported and the system lacks the capability to convey a 2-year storm event.

PROPOSED ACTION AND ALTERNATIVES

Langley AFB proposes to construct a new storm sewer system to alleviate the flooding along the flightline and in the hangar area along Danforth Avenue. Additionally, the project proposes building a new pump station to discharge the collected runoff into the Back River. The new storm water system would be designed to handle the 10-year, 1-hour rain event. This EA analyzes the impacts associated with construction and operation of the proposed action alignment, an additional alternative, the Northeast Outfall alternative, and the no-action alternative.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences during the construction of proposed action and alternatives. Nine resource categories received thorough evaluation to identify potential environmental consequences. As indicated in Chapter 4.0, construction at either of the locations chosen would not result in significant impacts to any resource area.

Construction of the upgrades to the storm sewer system with the proposed action or Northeast Outfall alternative would be consistent with base plans and with the goals of the Coastal Zone Management Act (CZMA). Storm water standard construction practices would be included in the project construction to reduce the potential for soil erosion into the Chesapeake Bay watershed. No conflicts with existing on-base land uses would result from the construction at either site. Under the proposed action, on base roads would be closed temporarily during the construction of storm sewer along Danforth Avenue and Andrews Street and across Sweeney Boulevard. If the Northeast Outfall alternative were chosen, then Ward Road would require temporary closure. In all cases, the contractor would provide signage and detours to maintain access to this area for base personnel.

Construction activity, employment, and earnings associated with the proposed action and the Northeast Outfall alternative would be very similar. No adverse environmental consequences would be expected. Construction and operation of the upgrades to the storm sewer system would not create any disproportionately high and adverse health and environmental effects on low-income and minority populations on base or in the vicinity of Langley AFB, and no environmental health or safety risks would disproportionately affect children at either site.

Construction activities are not expected to impact cultural resources at the proposed action or the Northeast Outfall alternative locations. Both areas have been inventoried for archaeological resources and no significant resources have been identified. No significant architectural resources have been identified at the proposed action or alternative areas, although construction would take place in the Langley Field Historic District and consultation with the State Historic Preservation Office has been initiated.

Construction activities would have no adverse effects to individual species or native plants or animals at either location since the only plant or animal species likely to be displaced from this marginal habitat are individuals of common and locally abundant species. No jurisdictional wetlands would be affected by the proposed action. Construction of the Northeast Outfall alternative has the potential to affect less than 1 acre of jurisdictional wetlands. Therefore, as a component of the alternative, wetlands would be developed in accordance with a mitigation plan approved by United States Army Corps of Engineers (USACE). No threatened, endangered, or special species/communities would be adversely affected by the proposed action or the Northeast Outfall alternative. Incidentally occurring listed, proposed, or candidate species are not likely to be adversely affected because no critical habitat exists on Langley AFB. The area to be disturbed is of low ecological value and bald eagles do not use Langley AFB for nesting or other critical life cycle functions.

Construction and operation of the upgrades to the storm sewer system at the proposed action site would not be expected to significantly affect the water quality of the Back River and Chesapeake Bay. While construction of the upgrades to storm sewer under the Northeast Outfall alternative would improve drainage along the flightline, flooding would still occur along Danforth Avenue. The majority of Langley AFB, including both alignments, is located

within the 100-year floodplain. There is no practicable alternative, however, that would not involve construction in the floodplain. No adverse environmental consequences are anticipated from the construction with either alternative.

Construction-related air emissions would be generated both on base and within the region with the hauling of fill material to the base and other earth-moving activities. These emissions would be less than one percent of emissions in the Hampton Air Quality Control Region (AQCR). Langley AFB is located in a maintenance area for ozone; however, the proposed action would not contribute ozone-related emissions above United States Environmental Protection Agency (USEPA) established *de minimis* levels for ozone. Therefore, a formal air quality conformity determination is not required.

Construction of the upgrades to the storm sewer system under either alternative would have the potential to disturb portions of various Environmental Restoration Program (ERP) sites. The Langley AFB ERP Manager would coordinate a waiver from ACC policy concerning construction disturbances on ERP sites. Waivers would identify the appropriate control measures that would be necessary for the activities at the ERP sites and no long-term adverse environmental consequences are anticipated. No appreciable hazardous waste generation is expected with the operation of the new pumping station.

Construction of the upgrades to the storm sewer system at either site would have temporary, localized noise effects during the construction phase. These localized noise increases may disrupt base personnel in nearby structures, however, the noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Section *Page*

EXECUTIVE SUMMARY ES-1

1.0 PURPOSE AND NEED FOR ACTION 1-1
1.1 Introduction 1-1
1.2 Background 1-1
1.3 Purpose and Need 1-3

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES 2-1
2.1 Proposed Action 2-1
2.2 Northeast Outfall Alternative 2-3
2.3 No-Action Alternative 2-5
2.4 Alternatives Considered But Not Carried Forward 2-5
2.5 Environmental Impact Analysis Process 2-5
2.5.1 Public and Agency Involvement 2-5
2.5.2 Regulatory Compliance 2-6
2.5.3 Permit Requirements 2-6
2.6 Comparison of Alternatives 2-7

3.0 AFFECTED ENVIRONMENT 3-1
3.1 Land Use Resources 3-1
3.1.1 Transportation 3-1
3.1.2 Visual Resources 3-2
3.1.3 Land Use 3-2
3.2 Socioeconomics and Environmental Justice 3-4
3.2.1 Socioeconomics 3-4
3.2.2 Environmental Justice 3-5
3.3 Cultural Resources 3-6
3.3.1 Architectural Resources 3-6
3.3.2 Archaeological Resources 3-6
3.3.3 Traditional Resources 3-6
3.4 Biological Resources 3-7
3.4.1 Terrestrial Communities 3-7
3.4.2 Wetland and Freshwater Aquatic Communities 3-7
3.4.3 Threatened, Endangered, and Special Status Species/Communities 3-9
3.5 Water Resources 3-9
3.6 Air Quality 3-11
3.7 Hazardous Materials and Waste Management 3-14
3.8 Safety 3-17
3.9 Noise 3-17

Section *Page*

4.0 ENVIRONMENTAL CONSEQUENCES 4-1
4.1 Land Use Resources 4-1
4.1.1 Proposed Action 4-1
4.1.2 Northeast Outfall Alternative 4-2
4.1.3 No-Action Alternative 4-2
4.2 Socioeconomics 4-2
4.2.1 Proposed Action 4-2
4.2.2 Northeast Outfall Alternative 4-3
4.2.3 No-Action Alternative 4-3
4.3 Cultural Resources 4-3
4.3.1 Proposed Action 4-3
4.3.2 Northeast Outfall Alternative 4-4
4.3.3 No-Action Alternative 4-4
4.4 Biological Resources 4-4
4.4.1 Proposed Action 4-4
4.4.2 Northeast Outfall Alternative 4-5
4.4.3 No-Action Alternative 4-6
4.5 Water Resources 4-6
4.5.1 Proposed Action 4-6
4.5.2 Northeast Outfall Alternative 4-7
4.5.3 No-Action Alternative 4-7
4.6 Air Quality 4-7
4.6.1 Proposed Action 4-7
4.6.2 Northeast Outfall Alternative 4-9
4.6.3 No-Action Alternative 4-9
4.7 Hazardous Materials and Waste Management 4-9
4.7.1 Proposed Action 4-9
4.7.2 Northeast Outfall Alternative 4-10
4.7.3 No-Action Alternative 4-10
4.8 Safety 4-10
4.8.1 Proposed Action 4-10
4.8.2 Northeast Outfall Alternative 4-10
4.8.3 No-Action Alternative 4-11
4.9 Noise 4-11
4.9.1 Proposed Action 4-11
4.9.2 Northeast Outfall Alternative 4-11
4.9.3 No-Action Alternative 4-12

5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES 5-1
5.1 Cumulative Effects 5-1
5.1.1 Definition of Cumulative Effects 5-1
5.1.2 Past, Present, and Reasonably Foreseeable Actions 5-2
5.1.3 Analysis of Cumulative Impacts 5-2
5.2 Irreversible and Irretrievable Commitment of Resources 5-3

Section *Page*

6.0 REFERENCES 6-1

7.0 LIST OF PREPARERS 7-1

APPENDIX A CONSULTATION LETTERS
APPENDIX B PERMIT APPLICATION

TABLES

Table *Page*

2-1 Environmental Related Permitting 2-7
2-2 Summary of Potential Environmental Impacts of Proposed Action and No-Action Alternative 2-8
3-1 Threatened, Endangered, and Special-Status Species/Communities that Occur or Potentially Occur on Langley AFB 3-10
3-2 Baseline Emissions for Langley AFB Affected Environment 3-13
4-1 Project Emissions – Proposed Action 4-8

FIGURES

Figure *Page*

1-1 Map of Langley AFB, Virginia 1-2
2-1 Proposed Action Location 2-2
2-2 Northeast Outfall Alternative Location 2-4
3-1 Langley AFB Wetlands Map 3-8
3-2 Langley AFB Floodplain Map 3-12
3-3 Environmental Restoration Program Sites in Project Vicinity 3-16

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force), 1st Fighter Wing (FW) proposes to upgrade the storm water sewer system servicing the flightline area at Langley Air Force Base (AFB). This environmental assessment (EA) has been prepared to analyze the potential environmental consequences associated with the proposed action and alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq*.). This document was prepared in accordance with the following:

- Regulations established by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508).
- Air Force Instruction (AFI) 32-7061 (*The Environmental Impact Analysis Process* [EIAP], as codified in 32 CFR 989).

This EA also provides an evaluation of potential coastal zone impacts pursuant to National Oceanic and Atmospheric Administration Coastal Zone Management regulations (15 CFR 930). Consequently, this EA serves as coastal consistency determination documentation with respect to implementation of the proposed action or alternatives.

Section 1.2 provides background information that briefly describes Langley AFB. The purpose and need for the proposed action are described in Section 1.3. A detailed description of the proposed action, Northeast Outfall alternative, and the no-action alternative is provided in Chapter 2.0. Chapter 3.0 describes the existing conditions of various environmental resources that could be affected if the proposal were implemented. Chapter 4.0 describes how those resources would be affected by implementation of the proposed action and alternative, or the no-action alternative. Chapter 5.0 addresses the cumulative effects of the proposed action, as well as other recent past, current, and future actions that may be implemented in the region of influence (ROI) for the proposed action.

1.2 BACKGROUND

Langley AFB is located approximately 175 miles south of Washington, D.C., near the south end of the lower Virginia Peninsula on the Back River, a tributary of the Chesapeake Bay. Langley AFB is situated in the Hampton Roads Standard Metropolitan Statistical Area, in the City of Hampton, Virginia. Other cities in the area include Newport News, Poquoson, Norfolk, and Portsmouth. As shown in Figure 1-1, the main base occupies 2,883 acres between the Northwest and Southwest Branches of the Back River.

Figure 1-1. Map of Langley AFB, Virginia

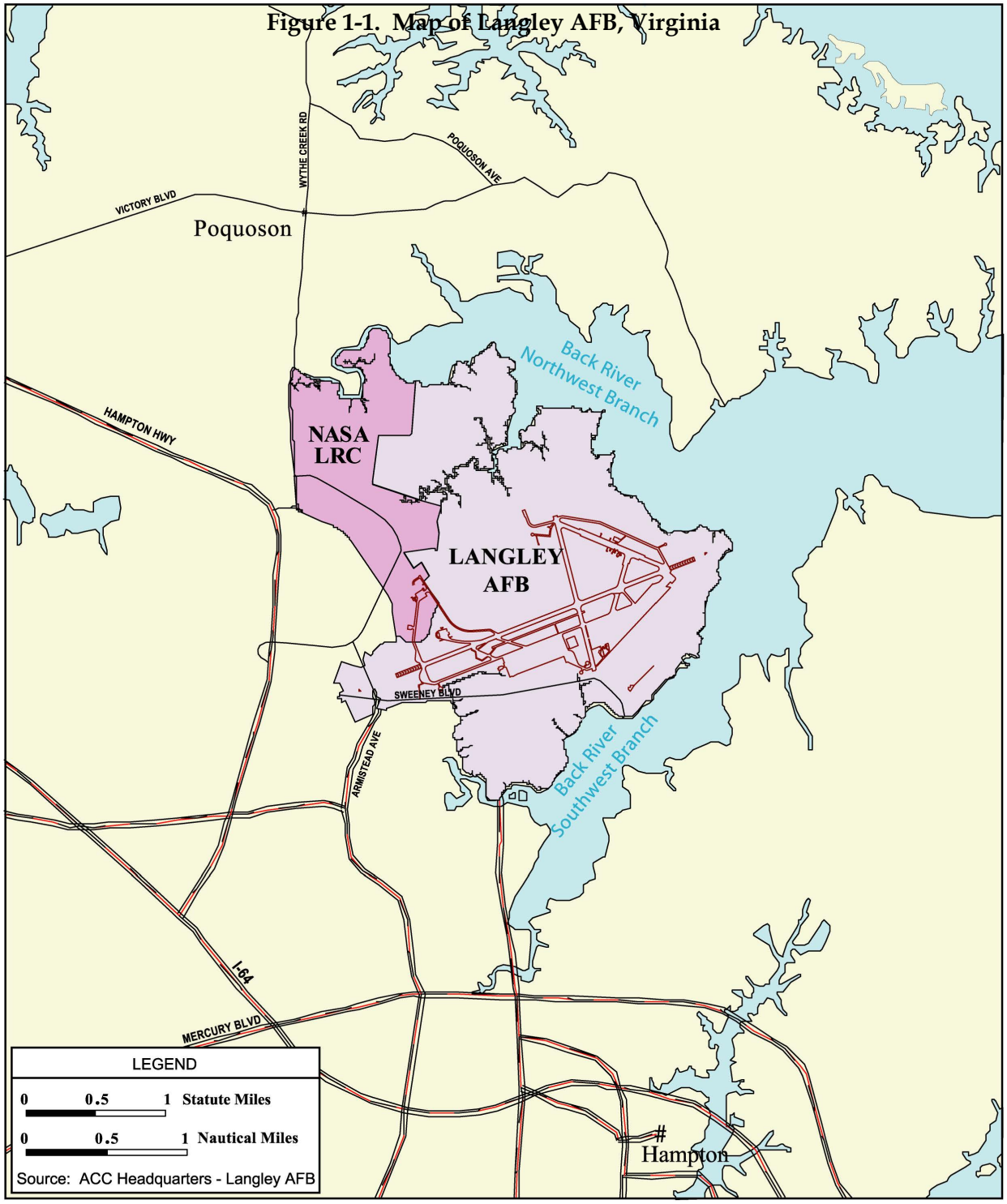


Figure 1-1

Map of Langley AFB, Virginia

Langley AFB is headquarters for Air Combat Command (ACC) and home of the 1st FW. ACC is one of eight major commands in the Air Force and is responsible for organizing, equipping, training, and maintaining combat-ready forces at the highest level of readiness. The primary mission of Langley AFB is to provide air operational support to a broad spectrum of aircraft in both peacetime and combat environments. General goals of the base are to sustain the resources and relationships deemed appropriate to pursue national interests, and provide for the command, control, and communications necessary to execute the missions of the Air Force, ACC, and the 1st FW.

1.3 PURPOSE AND NEED

The purpose of this action is to upgrade the storm water sewer system that provides service to the flightline area at Langley AFB and discharges to the Back River through the base's Virginia Pollutant Discharge Elimination System (VPDES) outfall number 7. This drainage area encompasses approximately 69 acres and includes the areas along Andrews Street and Danforth Avenue. Much of the system in this portion of the base is associated with the original infrastructure. Surveys of the storm sewer in Danforth Avenue and Andrews Street indicate that the sewer has settled/collapsed creating sag points in the line. These sag points prevent the surface water from draining directly to the Back River, and force the runoff to be stored until it can be drained through the enclosed system (United States Army Corps of Engineers [USACE] 2001)

The existing storm sewer is highly susceptible to tidal influences and modeling indicates that it does not meet current design criteria. Most of the system should be designed to carry the 10-year, 1-hour storm event[1] without surcharging the manholes and inlets in the system. About 75 percent of the system's structures do not meet this requirement (USACE 2001). Base personnel report flooding on a regular basis and the system lacks the capability to convey a 2-year storm event.

[1] A 10-year, one-hour storm event is defined as a storm event that has a 10 percent chance (1/10) of occurrence in a given year. In Hampton, Virginia, a 10-year, one-hour storm event would produce 2.2 inches, while a 2-year, one-hour storm event would produce 1.5 inches.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Langley AFB proposes to upgrade the storm water sewer system servicing the flightline area at Langley AFB. In addition to the proposed action, this EA evaluated the Northeast Outfall alternative, and the no-action alternative. Figure 2-1 depicts the location of the proposed action.

2.1 PROPOSED ACTION

The proposed action consists of constructing a new storm drainage system to alleviate the flooding in the hangar area along Danforth Avenue and would be adequate to handle the 10-year 1-hour rain event as shown in Figure 2-1. Additionally, the design proposes building a new pump station to discharge the collected runoff into the Back River and prevent the tidal flows from the Back River from filling the storm drainage system.

The new storm sewer would convey all of the storm water generated along Danforth Avenue and the upper half of Andrews Street. Upon completion of this project, only the lower half of Andrews Street would discharge through the existing outfall number 7. Storm sewer construction would involve the installation of 8,700 linear feet of various sizes of reinforced concrete pipe and box culvert and manholes and storm drains. Pipe sizes range from 12-inch to 60-inch diameter and would include approximately 1,200 feet of 8-foot by 6-foot box culvert. Excavation and placement of bedding material and backfill would require the movement of approximately 21,000 cubic yards of excavated material and 11, 800 cubic yards of materials. Much of the construction for the storm sewer along the airfield pavement would take place within grassed areas adjacent to the airfield pavement. Paved areas surrounding the storm drain inlets and manholes being installed or replaced would be disturbed, as would the airfield pavement between aircraft maintenance facilities.

Storm sewer construction within Danforth Avenue and Andrews Street and at the intersection of Sweeney Boulevard and Andrews Street would temporarily interrupt traffic flow. Construction would start at the outfall end of the storm water system and proceed northwest up Andrews Street one block at a time. Street closure, excavation, pipe placement, backfilling, and pavement would be completed within 90 days on Andrews Street and Danforth Avenue and a closure of Dodd Avenue would not exceed 21 days. The project contractor would institute a plan to manage traffic during the construction period and provide the appropriate signs and barricades as required in construction plans.

Construction of the box culvert would require demolition of a portion of the foundation of Building 720. Building 720 was demolished without the removal of the foundation. A twenty-foot wide section of the foundation, which extends approximately five feet above ground surface and the existing concrete footing would be removed.

Figure 2-1. Proposed Action Location

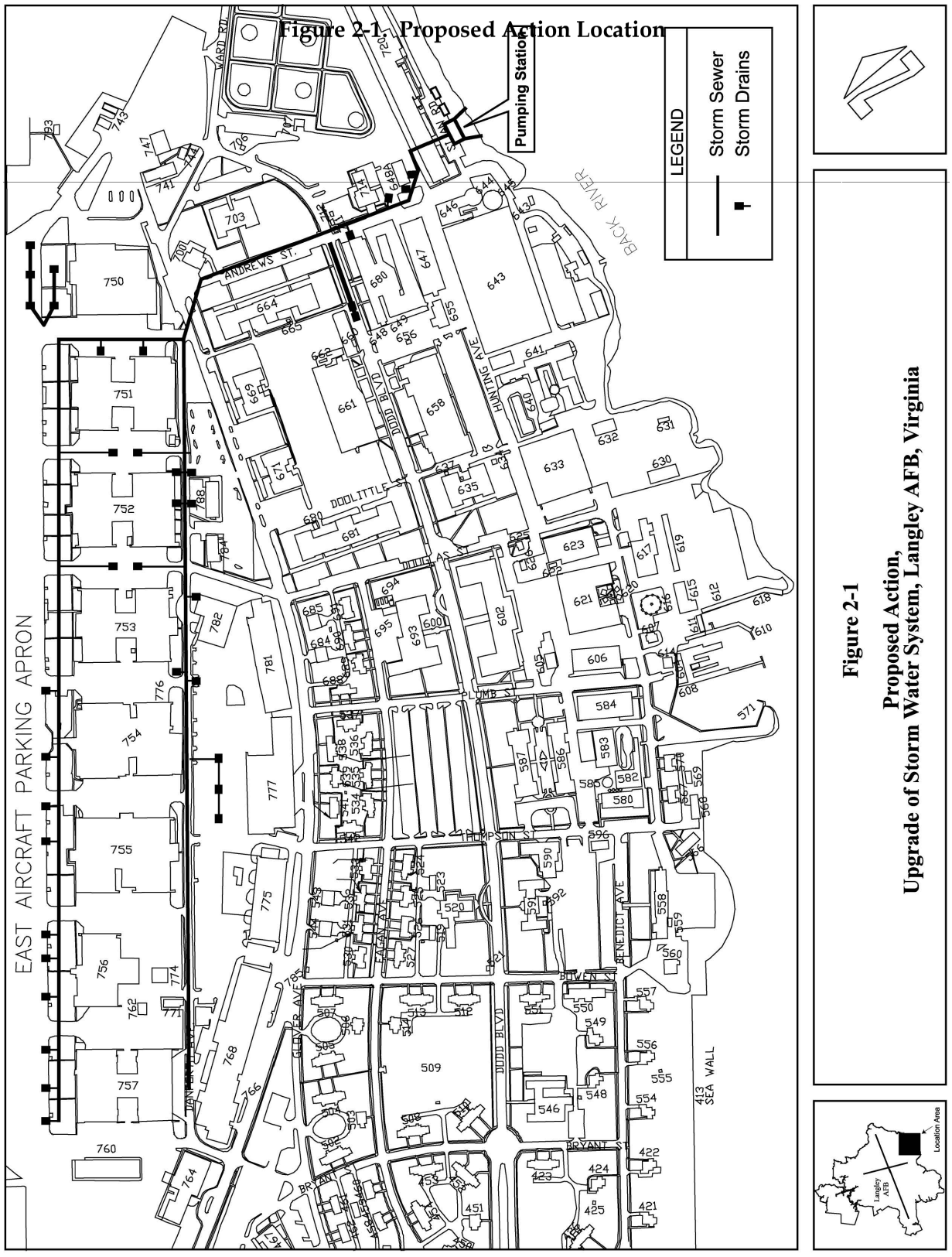


Figure 2-1
Proposed Action,
Upgrade of Storm Water System, Langley AFB, Virginia

The new pump station would be built approximately 300 feet north of the existing outfall number 7 and discharge through a 40-foot wide flume composed of a riprap bottom and concrete sidewalls. The pump station would consist of a 900-square foot pump room building, a 300-square foot electrical room building, a 1,000-kilowatt emergency generator steel platform and a 6,000-gallon double wall above ground diesel fuel storage tank. The pump station would consist of four 200 horsepower pumps. Each pump would be equipped with a grit filter to reduce the introduction of sediments into the Back River. Regular maintenance of the filters would include removal and disposal of the sediment in accordance with state and federal regulations.

At the end of the flume, the bank of the Back River would be reconstructed with approximately 16 cubic yards of riprap armor designed to protect the bank from erosion during flume discharge. Placement of new riprap would require removal of the existing concrete rubble, grading the existing riverbank, installation of a geotextile fabric, and placement of riprap. Riprap used for this project would come from the base's supply of recycled concrete which illustrates the base's commitment towards using recycled products. This activity would extend to the mean low water elevation.

Prior to the initiation of construction, silt fences, storm drain inlet protection, temporary diversion dikes, tree protection, and other appropriate standard management practices would be established in accordance with the *Virginia Erosion and Sediment Control Handbook*. Construction of the upgrades to the storm sewer is planned for completion within 24 months of project initiation.

2.2 NORTHEAST OUTFALL ALTERNATIVE

An alternative to the proposed action would separate the two storm water pipes draining the flightline and Danforth Avenue. Currently these two systems combine and discharge through outfall number 7. Under this alternative the existing storm sewer running between the flightline and the hangers would be removed and replaced with larger pipe ranging from 12 inch to 60 inch. Approximately 2,700 feet of existing storm sewer would be replaced. The storm sewer line would be extended northeast in the area between the aircraft refueler parking lot and the end of the primary Runway 8/26 and then east under Ward Road to a point just south of Building 732 with a new outfall to the Back River (see Figure 2-2). New construction would include approximately 2,200 feet of storm sewer and a new outfall structure and riprap. The storm sewer system along Danforth Avenue would be separated from the flightline system and continue to discharging through outfall number 7. Flooding along Danforth Avenue would not be eliminated with this option, however storm water currently flowing from the flightline into this system would be redirected, providing a slight increase in the capability of the existing system.

Figure 2-2. Northeast Outfall Alternative Location

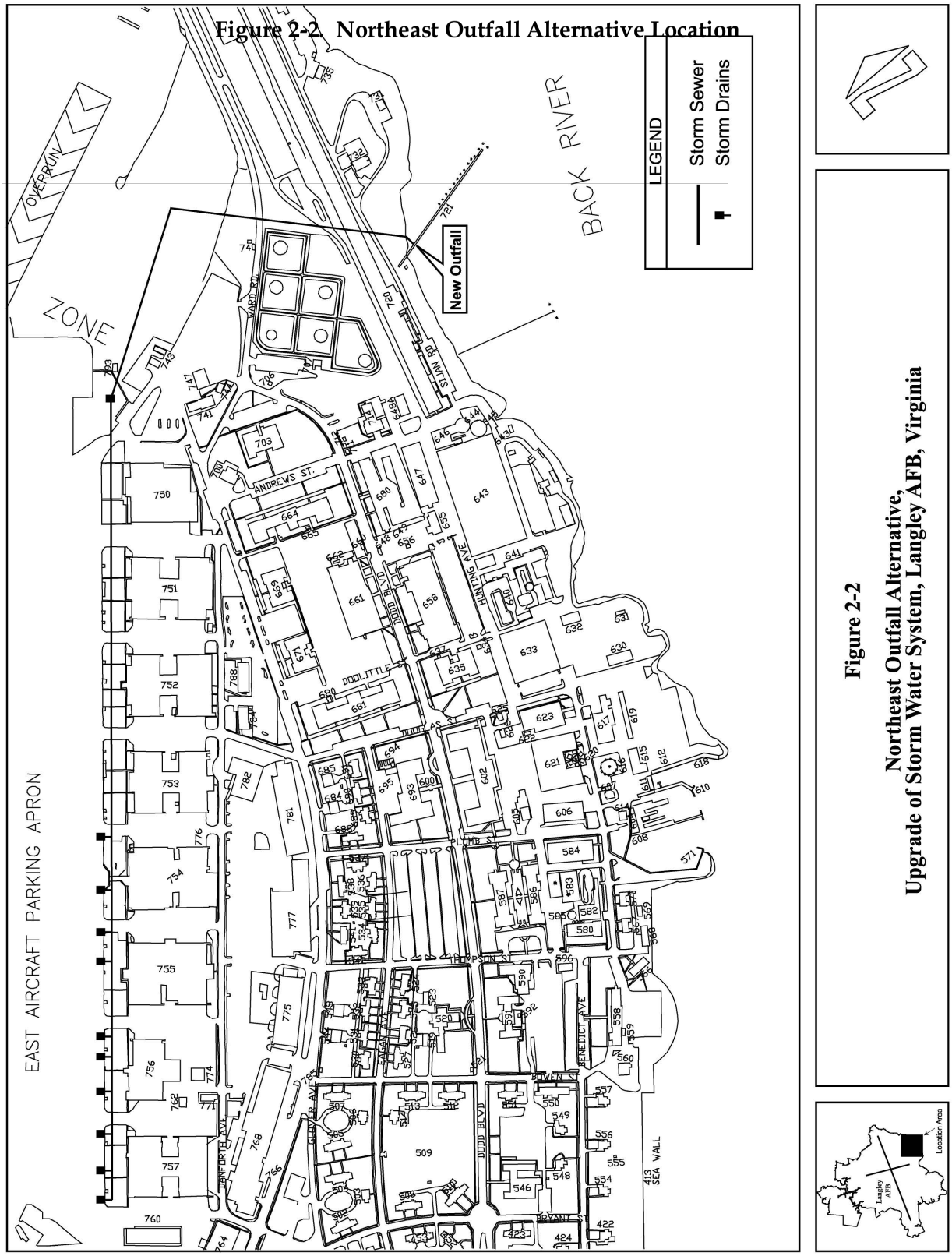


Figure 2-2
Northeast Outfall Alternative,
Upgrade of Storm Water System, Langley AFB, Virginia

Construction of the storm sewer would require demolition of a portion of the foundation of Building 720. Building 720 was demolished without the removal of the foundation. A twenty-foot wide section of the foundation, which extends approximately five feet above ground surface and the existing concrete footing would be removed. Construction of a pump station would not be included in this alternative.

Prior to the initiation of construction, silt fences, storm drain inlet protection, temporary diversion dikes, tree protection, and other appropriate standard management practices would be established in accordance with the *Virginia Erosion and Sediment Control Handbook*. Construction of the upgrades to the storm sewer is planned for completion within 12 months of project initiation.

2.3 NO-ACTION ALTERNATIVE

Under the no-action alternative, the storm sewer system action would not be constructed. Aircraft hangers and associated support buildings on Danforth Avenue would be subject to flooding during storm events and elevated high tides.

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

In addition to the proposed action discussed above, another alternative was reviewed and found to be infeasible or unreasonable and, therefore, eliminated from detailed consideration. This alternative included the construction of storm water retention and or detention ponds on open grounds in this portion of the base. The only open areas are located adjacent to the flightline. Locating storm water collection ponds near flightlines presents a substantial bird-aircraft strike hazard and is avoided by the Air Force.

2.5 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

The EIAP includes the review of all information pertinent to the proposed action and reasonable alternatives and provides a full and fair discussion of potential consequences to the natural and human environment. The process includes involvement with the public and agencies to identify possible consequences of an action, as well as the focusing of analysis on environmental resources potentially affected by the proposed action or alternatives.

2.5.1 Public and Agency Involvement

In October 2002, the Air Force met with state agencies to discuss potential issues and determine permitting requirements. Through this scoping process, the Air Force obtained information regarding pertinent environmental issues the agencies felt should be addressed in the environmental impact analysis. Agency consultations were undertaken with regard to cultural

resources and regarding biological resources, primarily for compliance with the Endangered Species Act (ESA).

To facilitate public involvement in this project, the Air Force prepared and published newspaper advertisements announcing the availability of the Draft EA for public and agency review.

2.5.2 Regulatory Compliance

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, 42 USC 4321 et seq.) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document was prepared in accordance with AFI 32-7061, which implements Section 102 (2) of NEPA and regulations established by the CEQ (40 CFR 1500-1508; 32 CFR Part 989).

Implementation of the proposed action or an alternative would require concurrence from several regulatory agencies. Compliance with the ESA involves communication with the Department of the Interior (delegated to the U.S. Fish and Wildlife Service [USFWS]) in cases where a federal action could affect the listed threatened or endangered species, species proposed for listing, or species that could be candidates for listing. A letter was sent to the appropriate USFWS agencies, as well as their state counterparts, informing them of the proposed action and alternatives and requesting data regarding applicable protected species. Since no adverse effects are anticipated, further consultation is not required.

The preservation of cultural resources falls under the purview of State Historic Preservation Office (SHPO), as mandated by the National Historic Preservation Act (NHPA) and its implementing regulations. A letter was sent to the SHPO informing them of the proposed action and alternatives.

Appendix A includes copies of relevant coordination letters and letters regarding protected species provided by interested agencies.

2.5.3 Permit Requirements

This EA has been prepared in compliance with NEPA; other federal statutes, such as the Clean Air Act (CAA) and the Clean Water Act; Executive Orders (EOs), and applicable state statutes and regulations. Table 2-1 summarizes applicable federal, state, and local permits and the potential for change to the permits due to the proposed action or alternatives. In addition to this EA being prepared for the decisionmaker and the interested public, it is also a tool for Air Force personnel to ensure compliance with all regulatory requirements from proposal through project implementation.

Table 2-1. Environmental Related Permitting

Type of Permit or Regulatory Requirement	*Requirement*	*Agency*
Endangered Species Act	Required to consult on impacts of project implementation on federally listed or proposed threatened and endangered species	U.S. Fish and Wildlife Service
Section 404 Permit	Required for authorizing fill within wetlands or Waters of the United States	U.S. Army Corps of Engineers Norfolk District
Clean Water Act	Virginia Pollutant Discharge Elimination system storm water permit	Commonwealth of Virginia, Department of Conservation and Recreation
Joint Permit For Activities in Water and Wetlands of the Commonwealth of Virginia	Construction within the waters of the Commonwealth of Virginia	City of Hampton Wetlands Board
National Historic Preservation Act Section 106	Consultation with State Historic Preservation Office	Commonwealth of Virginia, Department of Historic Resources
Clean Air Act (CAA)	Amend existing permit for installation of emergency generators	Commonwealth of Virginia, Department of Environmental Quality
Coastal Consistency Determination	Determine consistency with enforceable policies of Commonwealth's Coastal Zone Management Program	Commonwealth of Virginia, Department of Environmental Quality
Mechanical Permit	Installation of aboveground storage tanks (ASTs)	City of Hampton

2.6 COMPARISON OF ALTERNATIVES

Table 2-2 summarizes the potential environmental impacts of the proposed action, the Northeast Outfall alternative, and the no-action alternative, based on the detailed impact analyses presented in Chapter 4.0. In no instance would the potential environmental consequences be significant with the implementation of the proposed action or alternative. Under the no-action alternative, no changes would be made to the storm water system. Flooding would continue along the flightline and along Danforth Avenue.

Table 2-2. Summary of Potential Environmental Impacts of Proposed Action and No-Action Alternative

Resource	*Proposed Action*	*Northeast Outfall Alternative*	*No-Action Alternative*
Land Use Resources	0	0	0
Socioeconomics	+	+	0
Cultural Resources	0	0	0
Biological Resources	0	-	0
Water Resources	-	-	0
Air Quality	-	0	0
Hazardous Materials and Waste Management	-	-	0
Safety	0	0	0
Noise	-	-	0

- = Adverse, but not significant, impact
+ = Positive/beneficial impact
0 = No change

3.0 AFFECTED ENVIRONMENT

This chapter describes relevant environmental conditions at Langley AFB for resources potentially affected by the proposed action, alternatives, and no-action alternative described in Chapter 2.0. In compliance with guidelines contained in the NEPA, CEQ regulations, and AFI 32-7061, the description of the existing environment focuses on those environmental resources potentially subject to impacts. For the EIAP, the resources to be analyzed are identified and the expected geographic scope of potential impacts, known as the ROI, is defined. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support. In the following sections, the existing environmental conditions for each of the environmental resources are presented.

3.1 LAND USE RESOURCES

The attributes of land use addressed in this analysis include transportation, visual resources, and land use. Transportation addresses roads and circulation. Visual resources present the natural and manufactured features that constitute the aesthetic qualities of an area. Land use focuses on general land use patterns, as well as management plans, policies, ordinances, and regulations. These provisions determine the types of uses that are allowable and identify appropriate design and development standards to address specially designated or environmentally sensitive areas. The ROI for land use resources consists of Langley AFB.

3.1.1 Transportation

Access to Langley AFB is provided from Interstate 64 (I-64) via Armistead Avenue to the west of the base, and from Mercury Boulevard (U.S. Route 258/Virginia State Route [SR] 32), via LaSalle Avenue (SR 167) or King Street (SR 278). Langley AFB has a network of streets that provide access to all base facilities (refer to Figure 2-1). Nealy Avenue begins at the main gate and continues northeast through the installation. Sweeney Boulevard is the primary east west corridor linking directly to the west gate at Armistead Avenue. Parking in some on-base areas is limited. Parking lot utilization and traffic engineering studies have been conducted. These studies yielded a variety of recommendations regarding parking lot use and transit opportunities (Air Force 2001a). New signal controllers were recommended at Sweeney Boulevard and Elm Street and at Sweeney Boulevard and Nealy/Hammond Avenues (Military Traffic Management Command 1996).

The storm water sewer system upgrade would affect several on base roads. Andrews Street is a two lane connector between Sweeney and Dodd Boulevards with about 70 pull-in parking on both sides of the road for the entire length between the boulevards. Between Dodd Boulevard and Hunting Avenue there are approximately 40 pull-in parking spaces and the service entrance to Building 680. Danforth Avenue is a two lane road with no parking that runs behind the flightline hangars. It is currently blocked to through traffic due to F-22 hangar construction. Sweeney Boulevard is a main east west arterial road; however, within the project limits it is only

two lanes (one each way) and flow is interrupted with many turning movements into and out of parking lots and side streets.

3.1.2 Visual Resources

Langley AFB is located in the city of Hampton near the southern end of the lower Virginia Peninsula, between the Northwest and Southwest Branches of the Back River, a branch of the Chesapeake Bay. The base is in the Coastal Plain Physiographic province on Hampton Flat, a nearly flat plain that gently slopes toward the east, with elevations between 5 and 11 feet above mean sea level (MSL).

The main base occupies 2,883 acres of the total site. The largest structures on base are the aircraft operations and maintenance facilities located in the southern portion of the base. The National Aeronautics and Space Administration (NASA) operate a facility complex in the northwestern, southern, and southeastern portion of the base. The large wind tunnels and aeronautical test equipment that comprise the NASA facility resemble a large industrial area. A number of older buildings on base, such as the Albert Kahn-designed hangars, give the base a character reflecting its history as an important airbase from the beginning of the aviation era.

Much of the vegetation on base was planted at the time of the base's original construction (circa 1916). Towering oak trees are the dominant species of trees in the Langley Field Historic District. They have been used mainly as street plantings and as decorative plantings around many buildings. The uniformity of size and shape, as well as the fairly regular placement of these trees, are a unifying factor throughout the base, giving it a distinctive character. These trees, along with a number of smaller species, play a major role in breaking up open areas and providing shade for buildings, parking, and lawn areas. The tidal salt marshes and estuaries surrounding the base are prominent elements of the installation's open space.

3.1.3 Land Use

Land uses on Langley AFB are grouped by function in distinct geographic areas. For example, aircraft operations and maintenance facilities are located in the southern portion of the base. The residential areas on base are located along the Back River in the southeastern and northeastern portions of the base. The upgrade of the storm water system would take place in the flightline and ACC Campus areas. Both areas are highly developed with aircraft maintenance facilities, numerous multi-story buildings parking lots, runways, and aprons. Approximately 78 percent of the area is covered with impervious material (USACE 2001).

Adopted plans and programs guide land use planning on Langley AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development. The *Langley 2020–Commanders General Plan* provides an overall perspective concerning development opportunities and constraints. The base's *Integrated Natural Resource Management Plan* (Air Force 1998a) is used to coordinate natural resource management.

Approximately 8.9 acres of the Back River between the existing fuel pier and the storm water outfall #7 contains oyster lease grounds that are used by the public for the cultivation of oysters (Virginia Marine Resources Commission 2003). These state-owned grounds have been leased since 1929 by private individuals who use the submerged lands to grow oyster for public consumption. Each leaseholder pays fees to the Commonwealth of Virginia to work the associated leased grounds.

The Coastal Zone Management Act (CZMA) was enacted to develop a national coastal management program that comprehensively manages and balances competing uses of and impacts to any coastal use or resource. The CZMA federal consistency requirement, CZMA section 307, mandates that federal agency activities be consistent to the maximum extent practicable with the enforceable policies of a state management program. The federal consistency requirement applies when any federal activity, regardless of location, affects any land or water use or natural resource of the coastal zone. The question of whether a specific federal agency activity may affect any natural resource, land use, or water use in the coastal zone is determined by the federal agency.

The Virginia Department of Environmental Quality (VDEQ) oversees activities in the coastal zone of the Commonwealth through a number of enforceable programs. In reviewing the proposed action, VDEQ may require agencies to coordinate with its specific divisions or other agencies for consultation or to obtain permits; they also may comment on environmental impacts and mitigation. VDEQ enforceable programs and policies pertain to fisheries management, subaqueous lands management, wetlands management, dunes management, non-point source pollution control, point source pollution control, shoreline sanitation, air pollution control, and coastal lands management. Not all of these enforceable programs are applicable to the proposed action, as explained in the following sub-sections. The remaining programs (air pollution control, non-point source pollution control, point source pollution control, and wetlands management) are discussed in relevant resource sections (i.e., air quality, water resources, biological resources).

Fisheries Management. The construction of this project within the base cantonment area would have no adverse effect on the conservation and enhancement of finfish and shellfish resources, or on the promotion of commercial and recreational fisheries.

Subaqueous Lands Management. The construction of the storm water system at either location would not involve encroachment into, on, or over state-owned subaqueous lands.

Dunes Management. There are no sand-covered beaches or sand dunes in the vicinity of this project.

Shoreline Sanitation. This project would include interconnections to the base sanitary sewer system. No septic systems, regulated by this program, would be proposed.

3.2 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.2.1 Socioeconomics

The socioeconomic resources of the potentially affected region are characterized in terms of population, employment and earnings, and infrastructure.

POPULATION

The population of the region increased by just over 3 percent from 1990 to 2000, reaching 688,953 persons in 2000. By comparison, the population of the Commonwealth of Virginia increased by almost 14 percent during the same period, growing at an average annual rate of 1.3 percent. Approximately 88 percent of the 2000 population of the region resides in cities and towns that range in size from Poquoson (with a population of 11,039) to Norfolk (with a population of 261,174). The largest numbers of off-base military personnel reside in Hampton and Newport News.

The combined regional population is projected to increase from about 688,953 in 2000 to 712,013 by the year 2010 at an average annual growth rate of 0.5 percent.

EMPLOYMENT AND EARNINGS

Information regarding employment and earnings is presented for the following jurisdictions whose economies are closely associated with activities at Langley AFB: York County/ Poquoson; James City County/Williamsburg; Newport News; Hampton; and Norfolk. Comparisons are also presented with conditions for the Commonwealth of Virginia.

Total full- and part-time employment in the region decreased from 506,023 jobs in 1990 to 499,348 in 2000, at an average rate of –0.2 percent annually. The largest contributions to employment in 1999 were made by services (26.8 percent); military (15.7 percent); and retail trade (14.5 percent). For the years 1980, 1990, and 1999, the contribution of the military decreased from 21.7 percent to 21.0 percent and 15.7 percent, respectively. The sectors of the economy exhibiting the greatest addition of jobs over the period 1990-1999 were services and state and local government (United States Department of Commerce, Economics, and Statistics Administration [USDCESA] 2000).

Military employment in the Commonwealth of Virginia declined from 6.5 percent of total employment in 1980 to 4.2 percent in 1997. The sectors of the economy exhibiting the greatest addition of jobs in the state over the period 1990-1999 were services and retail trade. The number of personnel stationed at Langley AFB stood at about 8,250 active-duty military and 2,440 civilian workers in 1999. The value of payroll associated with government personnel at Langley AFB reached over $475 million in 1999 (USDCESA 2000).

Non-farm earnings in the region totaled more than $17 billion in 1999. The major contributions were made by military (22.7 percent); services (20.7 percent); and manufacturing (12.0 percent). In the Commonwealth of Virginia, non-farm earnings totaled almost $148 billion in 1999, with

the major contributions made by services (30.7 percent); manufacturing (10.9 percent); and state and local government (10.8 percent) (USDCESA 2000).

In addition to economic effects associated with payroll expenditures by Langley AFB personnel, the installation also purchases significant quantities of goods and services from local and regional firms. In 1999, annual expenditures by the base totaled over $266 million. Further, the Air Force estimates that the economic stimulus of Langley AFB created approximately 5,750 secondary jobs in the civilian economy (Air Force 1999a).

INFRASTRUCTURE

Potable Water. Langley AFB's primary potable water source is Big Bethel Water Treatment Plant. The city of Newport News serves as a backup source for Langley AFB. The two sources are currently operating at 43 and 73 percent of their capacities (City of Newport News 2000). The total active storage capacity of the Langley AFB system is 3.25 million gallons (Ecology and Environment 1999).

Wastewater Treatment. Wastewater generated at the base is discharged through the sanitary sewer system to the Hampton Roads Sanitation District (HRSD). The base has an HRSD Industrial Wastewater Discharge Permit (No. 0011) effective through 1 October 2003 that regulates the amount of pollutants that can be discharged to the wastewater treatment plant.

Electric Power and Natural Gas. Electric power is provided to the Back River substation to the base by Dominion Virginia Power. NASA Langley Research Center purchases electricity, which is then sold to Langley AFB. Virginia Natural Gas provides natural gas through an underground main that extends along Sweeney Boulevard. Both are adequate to meet existing and short-term projected demand.

3.2.2 Environmental Justice

EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)*, was issued by the President on February 11, 1994. Objectives of the EO, as it pertains to this document, include identification of disproportionately high and adverse health and environmental effects on low-income populations or minority populations that would be caused by a proposed federal action. Accompanying EO 12898 was a Presidential Transmittal Memorandum that referenced existing federal statutes and regulations, including NEPA, to be used in conjunction with EO 12898.

Environmental justice concerns the disproportionate effect of a federal action on low-income or minority populations. The existence of disproportionately high and adverse impacts depends on the nature and magnitude of the effects identified for each of the individual resources. If implementation of the proposed action were to have the potential to significantly affect people, these effects would have to be evaluated for how they adversely or disproportionately affect low-income or minority communities. Since no adverse effects occur because of the proposed action, the Northeast Outfall alternative, or the no-action alternative, neither minority nor low-

income groups would be affected disproportionately. Therefore environmental justice issues were eliminated from further analysis.

3.3 CULTURAL RESOURCES

Cultural resources are defined as any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, or religious reasons. Cultural resources are typically divided into three categories: archaeological; architectural; and traditional. Archaeological resources are locations where prehistoric, historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Architectural resources include standing buildings, dams, canals, bridges, and other structures. Architectural resources generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP). However, more recent structures, such as Cold War era resources, may warrant protection if they manifest "exceptional significance" or the potential to gain significance in the future. Traditional resources are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. The ROI for cultural resources is the area within which the proposed action has the potential to affect existing or potentially occurring archaeological, architectural, or traditional resources. For the proposed action, the ROI is defined as Langley AFB.

3.3.1 Architectural Resources

Many historic architectural resources have been identified at Langley AFB, particularly within the NRHP-eligible Langley Field Historic District that encompasses most of the eastern base (USACE 1998). The proposed action lies wholly within the Langley Field Historic District in the flightline and ACC Campus areas. The storm water system segments would pass near a number of historic buildings, including a row of historic hangars constructed between 1929 and 1932 (Buildings 750, 751, 752, 753, 757); Building 712, an electrical switch station (1940); and Building 714, a 1932 Guard House. All of these buildings are contributing members of the Langley Field Historic District (USACE 1998). The southeastern extension of the storm water system would pass through the previous location of the tow tank (Building 720). The tow tank was demolished in a previous action without removal of its foundation (Air Force 2001b).

3.3.2 Archaeological Resources

No archaeological sites have been identified within the area of the proposed action.

3.3.3 Traditional Resources

No traditional resources or American Indian issues have been identified for Langley AFB (USEPA 1998). No federally recognized Indian tribes or lands are located in the ROI or in the state of Virginia.

3.4 BIOLOGICAL RESOURCES

For purposes of the impact analysis, biological resources are divided into three major categories: (1) terrestrial communities, (2) wetland and freshwater aquatic communities, and (3) threatened, endangered, and special status species/communities. The ROI for biological resources includes Langley AFB and the specific areas associated with the proposed action and alternatives.

3.4.1 Terrestrial Communities

Only a relatively small portion of Langley AFB is forested or remains in its natural state. Plant communities include approximately 250 acres of mixed oak-hickory hardwood forests, 60 acres of 60-year-old planted loblolly pine forests, 450 acres of tidal salt marshes, and an undetermined amount of old-field successional areas. The remaining portions of the base consist of managed lawns and developed areas of buildings, structures, and pavement.

Wildlife on the base are widespread species that are habitat generalists or tolerant of disturbance. This includes a wide variety of game and furbearing species, small mammals, waterfowl, songbirds, raptors, amphibians, reptiles, and fish. The proximity of the base to estuarine and marine habitats of Chesapeake Bay provides habitat for a variety of neotropical migrants and waterfowl.

3.4.2 Wetland and Freshwater Aquatic Communities

Wetlands at Langley AFB encompass approximately 652 acres, 462 acres of which are non-freshwater estuarine wetlands. Freshwater wetlands on base include palustrine forested, emergent, and scrub-shrub wetlands. Forest and scrub-shrub wetlands occur in low-lying upland areas with nutrient-poor sandy soils and are dominated by bottomland hardwood trees and shrubs. Emergent wetlands primarily occur as small remnant patches, along drainage ditches, and as tidal marsh (Hobson 1996, Air Force 1998a). A wetlands delineation of the entire base was conducted in late 2000 and resulted in the wetlands map presented in Figure 3-1 (Air Force 2001c). The wetlands identified during this effort are under jurisdictional determination review by the Norfolk USACE (personal communication, Wittkamp 2001).

There are no wetlands within the area considered for the proposed action; however portions of the base between Ward Road and the alternative alignment are identified as estuarine, intertidal, emergent wetland with herbaceous vegetation. Also a portion of the shoreline immediately adjacent to the Back River is also a classified wetland (estuarine, intertidal, unconsolidated shore, irregularly flooded).

Salt and freshwater marshes of the Northwest and Southwest Branches of the Back River, New Market Creek, Brick Kiln Creek, Tabbs Creek, and Tides Mill Creek surround the base on three sides. Tidal flow from the Chesapeake Bay is substantial along these margins; however, most inland freshwater wetlands have been filled, drained to ditches, or converted into golf course features (Air Force 1998a). Currently, Langley AFB is in the process of restoring and stabilizing sections of Chesapeake shoreline through the establishment of smooth and saltmeadow

Figure 3-1. Langley AFB Wetlands Map

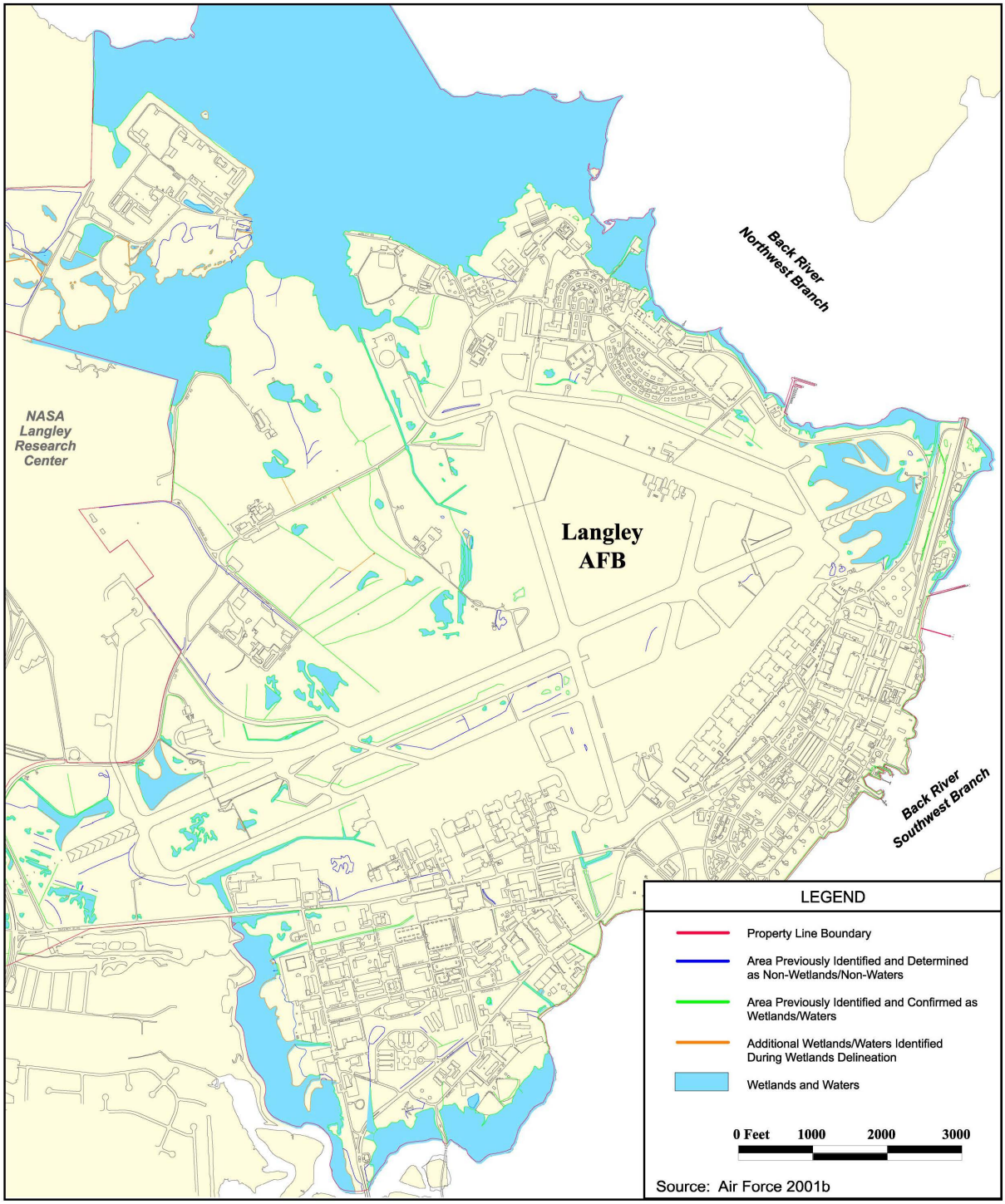


Figure 3-1

Langely AFB Wetlands Map

cordgrass fringe marsh. This project would result in a more erosion-resistant shoreline, improve water quality, and promote the Chesapeake Bay's unique estuarine ecosystem (Air Force 2001d).

Vegetation at the locations of the proposed storm water outfall for both the proposed action and Northeast Outfall alternative is sparse. Both areas are covered with riprap and the surrounding land uses are parking lots, roads, and lawns. Little to no submerged aquatic vegetation is present at either location.

3.4.3 Threatened, Endangered, and Special Status Species/Communities

Fifteen special status species occur, or have the potential to occur, on Langley AFB and are presented in Table 3-1. Twelve have special state status and four have additional federal status. No critical habitat occurs on base.

Langley AFB provides habitat for one federally listed threatened species: the bald eagle. Surveys conducted in 1993 and 1994 indicated that foraging by bald eagles occurs to a limited extent within creeks and marshes of the base. Habitat suitable for nesting or roosting occurs among the loblolly pines on the northern side of the base, but no nesting or long-term roosting has ever been observed. Uniform age/size structure of loblolly pine stands may limit use of the base as nesting or roosting habitat (Barrera 1995). The second federally listed threatened species, the northeastern beach tiger beetle, has no record of occurrence on base; it typically inhabits broad sandy beaches and has become a species of concern within the Chesapeake Bay ecosystem. The third federally listed threatened species, the piping plover, is associated with sandy beaches, which are not found on Langley AFB.

Virginia special status species include the barking treefrog, canebrake rattlesnake, Foster's tern, glossy ibis, great egret, Harper's fimbristylis, least tern, Mabee's salamander, night-heron yellow-crowned, and the peregrine falcon. The Canebrake rattlesnake has been found along the shore of the southwest branch of the Back River.

The following federal and commonwealth agencies were consulted concerning threatened, endangered, and special status species/communities. These agencies included the USFWS, Virginia Field Office, the Virginia Department of Game and Inland Fisheries; and the Department of Conservation and Recreation, Division of Natural Heritage. Copies of consultation letters and correspondence are provided in Appendix A.

3.5 WATER RESOURCES

Water resources include surface and groundwater features located within the base as well as watershed areas affected by existing and potential runoff from the base, including floodplains. Water supply to the base is addressed in section 3.2. The ROI is defined as the base and the immediate vicinity.

Table 3-1. Threatened, Endangered, and Special-Status Species/ Communities that Occur or Potentially Occur on Langley AFB

Species	*Status*	*Areas of Occurrence*
Plants		
Harper's fimbristylis *Fimbristylis perpusill*	SE	Coastal seasonal ponds
Virginia least trillium *Trillium pusillum var. virginianum*	FSC	Forested wetlands and mesic woods including the "green sea" wetlands. Recorded from the City of Hampton.
Invertebrates		
Northeastern beach tiger beetle *Cicindela dorsalis dorsalis*	FT	Broad beaches with well-developed sand dunes.
Amphibians		
Barking treefrog *Hyla gratiosa*	ST	Breeds in coastal seasonal freshwater ponds. Needs fish-free breeding habitat. Base at northern edge of range. Spends warm months in treetops, seeks moisture during dry periods by burrowing among tree roots and clumps of vegetation.
Mabee's salamander *Ambystoma mabeei*	ST	Breeds in coastal seasonal freshwater ponds. Needs fish-free breeding habitat. Tupelo and cypress bottoms in pine woods, open fields, and lowland deciduous forest.
Reptiles		
Canebrake rattlesnake *Crotalus horridus atricaudatus*	SE	Meadows, canebrake or "green sea" wetlands. At risk because of wetland loss. Swampy areas, canebrake thickets, and floodplains.
Birds		
Bald eagle *Haliaeetus leucocephalus*	FT/SE	Forages occasionally on base. Nests within three miles of the base.
Foster's tern *Sterna forsteri*	SS	Coastal and marshland bird that fishes the waters of the region.
Glossy ibis *Plegadis falcinellus*	SS	Wades in marshes and fishes the waters of the region.
Great egret *Asmerodius albus*	SC	Palustrine and estuarine wetlands; marshes.
Night-heron yellow-crowned *Nyctanassa violacea violacea*	SS	Wades in marshes and fishes the waters of the region.
Northern harrier *Circus cyaneus*	SS	Hunts over marshes and fields and is known to nest in the area.
Least tern *Sterna antillarum*	SS	Found feeding or nesting on beaches in the area
Peregrine falcon *Falco peregrinus*	SE	Observed foraging over salt marshes on base. Open wetlands near cliffs.
Piping plover *Charadrius melodius*	FT/ST	Prefers areas with expansive sand or mudflats (for foraging) in close proximity to a sand beach (for roosting). Fifty-two designated critical habitat units from North Carolina south to northern Florida along mainland beaches and barrier islands.

Notes: FSC = Federal Species of Concern; SE = State Endangered; FT = Federal Threatened; SS= State Sensitive; SC = State Candidate; ST = State Threatened

Langley AFB occupies a flat lowland peninsula with a gentle eastward slope of 1 foot per mile and elevations of 5 to 11 feet MSL within the Atlantic Coastal Plain physiographic province. The base is bounded on the northeast side by the Northwest Branch of the Back River, and on the southeast side by the Southwest Branch of the Back River, which flow into the Chesapeake Bay. Storm water drainage is carried by a series of pipes, box culverts, and open ditches to 53 outfalls with 26 outfalls associated with areas that contain industrial operations. The base has been issued a Virginia Pollutant Discharge Permit (No. VA0083194) that expires on May 2, 2005. This permit identifies effluent limitations and requires quarterly sampling and management of runoff. Langley AFB monitors three parameters at outfall number 7 on a quarterly basis: flow, pH, and Total Organic Carbon (TOC). The base's SWPPP identifies standard construction practices for minimizing runoff contamination (Air Force 2000a).

In the Langley AFB area, groundwater occurs in a shallow water table aquifer, an upper artesian aquifer system, and the principal artesian aquifer system. All three aquifers in this area contain water of moderate to poor quality due to high salinity and total dissolved solids; they have little or no potential for a conventional water supply (Air Force 2000a).

Due to its proximity to the Back River and the Chesapeake Bay, much of Langley AFB lies within the 100-year floodplain. Langley AFB is susceptible to high tide surges during storms and spring tides, and flooding is sometimes severe on the base. Figure 3-2 illustrates the extent of the floodplains on Langley AFB. A 100-year flood would cover all of the area designated 50-year flood zone and the areas designated in the 100-year flood zone (see Figure 3-2). A 500-year flood would cover the 50- and 100-year floodplain areas, and the areas designated in the 500-year flood zone.

Both the proposed action and the alternatives evaluated in this EA are located in the 100-year floodplain. An examination of Figure 3-2 indicates that there are no alternative locations available within the cantonment area that is above the 100-year floodplain. Areas above the 100-year floodplain are located within the clear zone on the western end of the runway and at a few small locations on the north side of the base, away from existing infrastructure.

3.6 AIR QUALITY

Air quality is described by the atmospheric concentration of six pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), and lead (Pb). Langley AFB is located within the Hampton Roads Intrastate Air Quality Control Region (AQCR) #223. The Hampton Roads AQCR includes four counties (York, James City, Isle of Wright, and Southampton) area, as well as nine independent cities (Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg). This area includes substantial industry, several military and commercial airfields, and a large population that generates emissions. Table 3-2 summarizes the baseline emissions (stationary and mobile) of criteria pollutants and precursor emissions for this AQCR. Baseline Langley AFB emissions are incorporated into these totals for

Figure 3-2. Langley AFB Floodplain Map

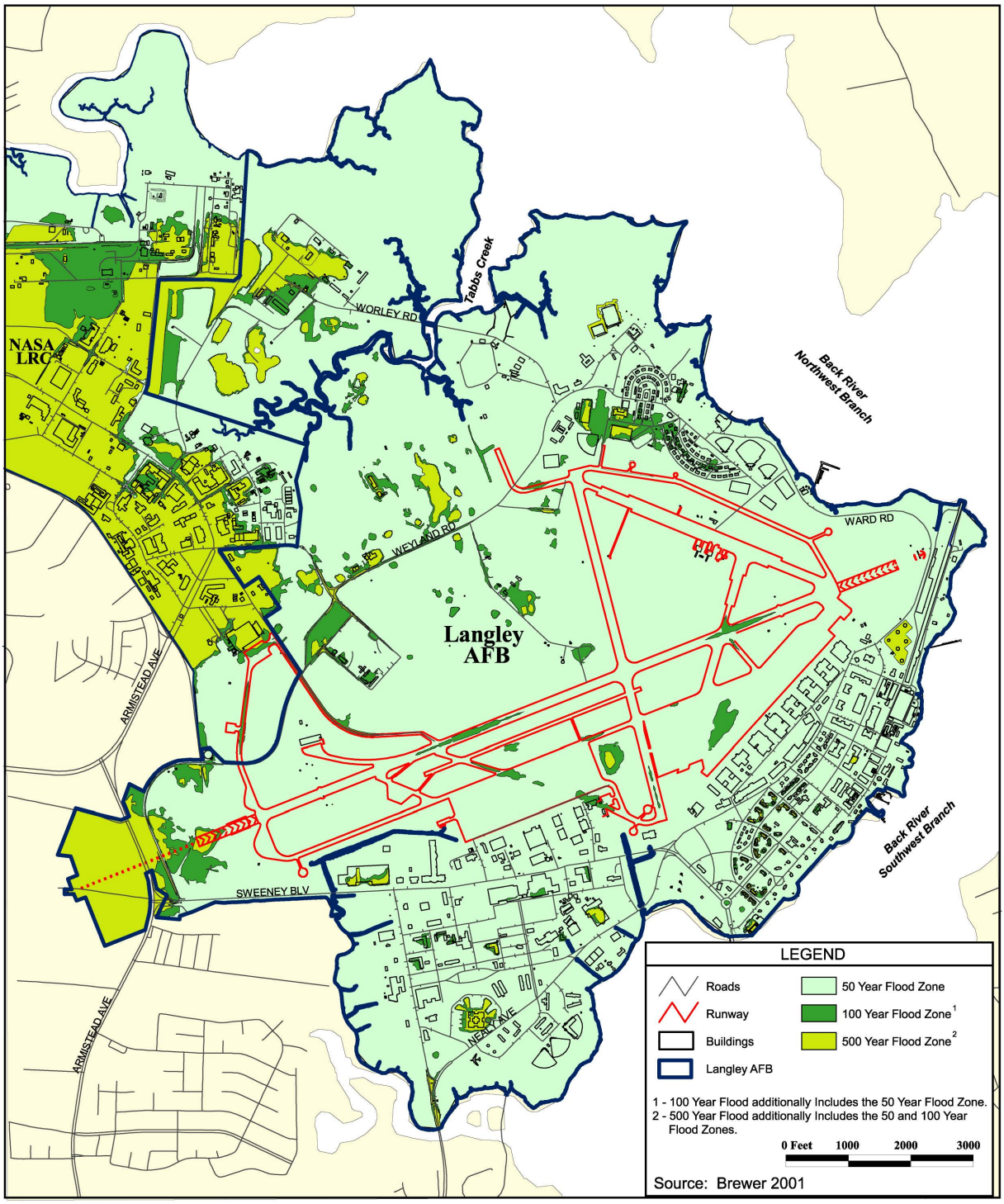


Figure 3-2

Langley AFB Floodplain Map

the AQCR. For each criteria pollutant, Langley AFB contributes less than 1 percent of regional emissions. The base has been issued a Synthetic Minor operating permit from VDEQ Title V program.

Table 3-2. Baseline Emissions for Langley AFB Affected Environment

Emissions	*Pollutants (tons per year)*				
	CO	**VOCs**	**NO_x**	**SO_2**	**PM_{10}**
Hampton Roads AQCR	257,325	79,750	83,560	110,220	49,860
Langley AFB	794.69	125.68	293.81	6.81	13.83
---Stationary Sources	33.79	21.18	52.61	1.21	5.63
---Mobile Sources	760.9	104.5	241.2	5.6	8.2

Sources: Federal Register (629123) June 26, 1997; Air Force 1999b; Air Force 2000b

Air quality in Hampton Roads AQCR is classified as attainment for all criteria pollutants. For ozone and its pollutant precursors (volatile organic compounds [VOCs] and nitrogen oxide [NO_x]), Virginia is considered in "transitional attainment" or "maintenance." For the newly established 8-hour O_3 standard, the United States Environmental Protection Agency (USEPA) has proceeded with initial designations for a number of areas based on 3 years of consecutive monitoring data. Designations are either "nonattainment" or "attainment/unclassifiable." While the future implementation date is still uncertain, once this new standard becomes enforceable, it appears that the Hampton Roads AQCR would not attain the 8-hour O_3 standard, based on data collected between 1999 and 2001 (USEPA 2002a). Also monitoring data is being collected for determining compliance with the newly developed $PM_{2.5}$ (particulates less than 2.5 micrometers in diameter) standard. Designation would be determined upon collection of the analysis of monitoring data (USEPA 2002b).

The CAA Section 176(c), General Conformity, establishes certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with each state's State Implementation Plan (SIP) for attainment of national ambient air quality standards (NAAQS). In 1993, USEPA issued the final rules for determining air quality conformity. Federal activities must not (1) cause or contribute to any new violation; (2) increase the frequency or severity of any existing violation; or (3) delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS. General conformity applies only to non-attainment and maintenance areas. If the emissions from a federal action proposed in a non-attainment area exceed annual emission thresholds identified in the rule (*de minimis* levels) or are regionally significant (identified as equal to, or more than, 10 percent of the emissions inventory for the region), a conformity determination is required of that action. The thresholds become more restrictive as the severity of the non-attainment status of the region increases. For the newly adopted 8-hour O_3

standards, according to USEPA Guidance (March 2000), conformity and other planning requirements would be triggered on the effective date of the final USEPA designations.

3.7 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Occupational Safety and Health Administration (OSHA); and the Emergency Planning and Community Right-to-Know Act (EPCRA). Hazardous materials have been defined in AFI 32-7086, *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals. Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 263.

Hazardous Materials

The majority of hazardous materials used by Air Force and contractor personnel at Langley AFB are controlled through an Air Force pollution prevention process called HAZMART. This process provides centralized management of the procurement, handling, storage, and issuing of hazardous materials and turn-in, recovery, reuse, recycling, or disposal of hazardous materials. The HAZMART process includes review and approval by Air Force personnel to ensure users are aware of exposure and safety risks.

Hazardous Waste

Langley AFB is a large-quantity hazardous waste generator. Hazardous wastes generated during operations and maintenance activities include solvents, metal-contaminated spent acids, and sludge from wash racks. Langley AFB recycles all lubricating fluids, batteries, oil filters, and shop rags. Hazardous wastes are managed in accordance with the *Langley AFB Hazardous Waste Management Plan*, dated 1 August 2001.

An asbestos management plan provides guidance for the identification of asbestos-containing materials (ACMs) and the management of asbestos. The 1st FW *Asbestos Management Plan* 32-10 provides guidance on the management of asbestos. An asbestos facility register is maintained by Civil Engineering. Persons inspecting, designing, or conducting asbestos response actions in public or commercial buildings must be properly trained and accredited through an applicable asbestos training program. The design of building alteration projects and requests for self-help projects are reviewed to determine if asbestos contaminated materials are present in the proposed work area and, if so, are disposed of in an off-base permitted landfill. A similar program is in-place to identify and control lead-containing materials in base facilities.

In February 2000, an investigation was conducted around the perimeter of Building 720 (Tow Tank) to evaluate surface soils for asbestos and lead contamination, and subsurface soils for total petroleum hydrocarbons (TPHs), volatiles (gasoline-range organics), and semi-volatiles (diesel-range organics) (USACE 2000).

Traces of asbestos contamination were detected in 38 of 40 soil samples; the exact percentage of asbestos content was not determined (USACE 2000). Lead contamination was detected in one localized area adjacent to the Tow Tank No. 2 office area on the southeastern end of the building. The investigation report recommended excavation and proper disposal of the lead-contaminated soil in this location (USACE 2000).

Petroleum contamination was detected at one test location, also in the vicinity of the Tow Tank No. 2 office area on the southeastern end of the building, at a depth of about 5 feet below grade. Combined TPH, TPH-gasoline range organics, and TPH-diesel range organics were detected at levels in excess of 100 parts per million (ppm), the VDEQ limit for requiring notification and potential remediation. In this one sample location, the investigation detected combined TPH levels of 5,002 ppm; TPH-gasoline range organics in a concentration of 582 ppm; and TPH-diesel range organics in a concentration of 4,420 ppm (USACE 2000).

Environmental Restoration Program

The Department of Defense (DoD) developed the Environmental Restoration Program (ERP) to identify, investigate, and remediate potentially hazardous material disposal sites that existed on DoD property prior to 1984. Forty-eight ERP sites, including one at Bethel Manor Housing, have been identified since the ERP began at Langley AFB. Thirty of the sites have been closed. The remaining 18 sites are regulated under CERCLA. The *Langley AFB Management Action Plan* (Air Force 2002) summarizes the current status of the base environmental programs and presents a comprehensive strategy for implementing actions necessary to protect human health and the environment. This strategy integrates activities under the ERP and the associated environmental compliance programs that support full restoration of the base.

ACC policy requires that any proposed project on or near a Langley AFB ERP site be coordinated through the Langley ERP Manager. The alignment of the proposed action would take the excavation near a number of ERP sites that have been closed (ERP sites ST-27, ST-34, and SS-62) and ERP OT-56 site, which is under remediation. The alignment of the alternative action would take the excavation near two additional ERP sites (Figure 3-3) (ERP Sites WP-02 and SS-23).

ERP Site OT-56 encompasses approximately 45 miles of storm sewer system serving the eastern portions of the Main Base. The site consists of a network of underground piping and/or surface ditches and channels that drain to the Southwest Branch of the Back River. The storm sewer system is subdivided into 29 separate outfall systems based on storm water drainage divisions that exist on the base proper. The proposed action site lies within four of these outfall systems. Site OT-56 has been extensively studied and remedial action is underway.

Figure 3-3. Environmental Restoration Program Sites in Project Vicinity

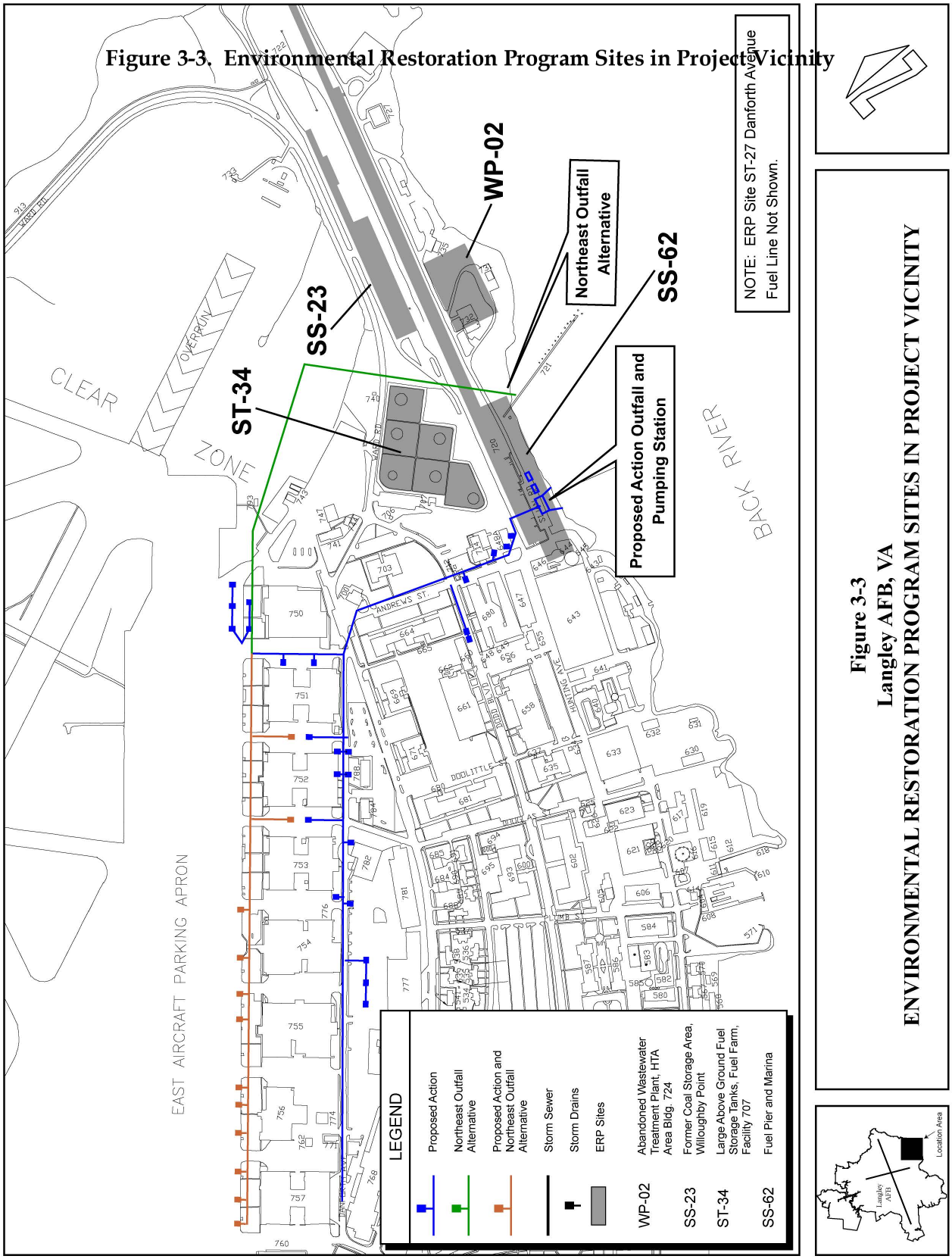


Figure 3-3
Langley AFB, VA
ENVIRONMENTAL RESTORATION PROGRAM SITES IN PROJECT VICINITY

ERP Site WP-02 is the location of a former wastewater treatment plant covering approximately 0.5 acres. The treatment plant operated from 1917 to 1968. All that remains of the facility is a rectangular, concrete-walled impoundment, which appears to have been used as a filtration tank. A Record of Decision for this site is currently being negotiated with the USEPA. Remedial action for site WP-02 is scheduled for FY 03. ERP Site SS-23, Former Coal Storage Area, is closed.

Solid Waste Management

Solid waste generated on Langley AFB is removed by contract services to either the City of Hampton's Bethel Sanitary Landfill or to the Hampton Waste-to-Energy facility for incineration. In Fiscal Year (FY) 00 the base generated 7,179 tons of solid waste and diverted 1,879 tons through recycling and composting activities. The base also generated 1,113 tons of construction and demolition debris.

3.8 SAFETY

Safety issues related to the proposed action focus on factors affecting construction and demolition. All contractors performing construction or demolition on Langley AFB are responsible for following safety regulations and worker compensation programs, and are required to conduct construction or demolition activities in a manner that does not pose a risk to their workers or Langley AFB personnel. In addition, Langley AFB has established an industrial hygiene program that addresses exposure to hazardous materials, use of personal protective equipment, and the availability of Material Safety Data Sheets. Contractor personnel are required to follow this program.

3.9 NOISE

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the type and characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day. The ROI for noise includes the area surrounding each of the project locations.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (often denoted dBA) are used to characterize sound levels that are heard especially well by the human ear. All sound levels analyzed in this EA are A-weighted; thus, the term dB implies dBA unless otherwise noted.

At Langley AFB, noise contributions from aircraft operations and ground engine run-ups at the airfield have been calculated using the NOISEMAP model, the standard noise estimation methodology used for military airfields. NOISEMAP uses the following data to develop noise contours: aircraft types, runway utilization patterns, engine power settings, airspeeds, altitude

profiles, flight track locations, number of operations per flight track, engine run-ups, and time of day. The *Final Environmental Impact Statement for the Initial F-22 Operational Wing Beddown* (2002) indicates that the proposed action and alternative sites would be in both the 75-80 and 80-85 Day-Night Average Sound Level (DNL) noise contours.

4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4.0 presents the environmental consequences of the proposed action and alternatives at Langley AFB for each of the resource areas discussed in Chapter 3.0. To define the consequences, this chapter evaluates the project elements described in Chapter 2.0 against the affected environment provided in Chapter 3.0. Cumulative effects of the proposed action with other foreseeable future actions are presented in Chapter 5.0.

4.1 LAND USE RESOURCES

4.1.1 Proposed Action

TRANSPORTATION

Proposed construction activities associated with upgrading the storm water system at Langley AFB would include excavation along the flightline and most of the length of Danforth Avenue and Andrews Street, including opening trenches across the major arterials of Sweeney and Dodd Boulevards. Construction on Andrews Street would take place one block at a time with the entire process taking up to 90 days. Closure of Dodd Avenue would not exceed 21 days. Some traffic delays, temporary loss of parking spaces, and inconvenience to motorists may be expected; however, detours would be established to direct vehicular traffic to alternate routes during construction. Construction vehicles would also contribute to delays and may damage existing infrastructure. No adverse environmental consequences are anticipated with the construction of the proposed action.

VISUAL RESOURCES

With the implementation of the proposed action, construction would take place in a step-wise progression from the outfall back up the flightline and Danforth Avenue. Construction of the pump station would require consultation and coordination with the Virginia SHPO to ensure that the new facility would be visually compatible with the overall Historic District. Since the facility would be constructed along the waterfront, it would be visible from the river. No adverse environmental consequences are anticipated with the construction of the proposed action.

LAND USE

The proposed action would upgrade the infrastructure of the flightline and ACC Campus portions of the base and is consistent with long-term plans for the base. This action would be in accordance with the Enforceable Regulatory Programs of the Virginia Coastal Resources Management Program. This project would not have any component that would affect any of the following sections of the Enforceable Regulatory Program: Fisheries Management, Dunes Management, Shoreline Sanitation, and Coastal Lands Management.

4.1.2 Northeast Outfall Alternative

TRANSPORTATION

Proposed construction activities associated with upgrading the storm water system at Langley AFB would include excavation along most of the length of the flightline and include opening a trench across Ward Road. Vehicular traffic would be diverted to Sijan Road to provide a through movement to the Lighter–than–Air portion of the base during construction across Ward Road, thereby eliminating any short-term environmental consequences of this alternative.

VISUAL RESOURCES

The construction of the upgrades to the storm system under this alternative would not have any adverse effect on the visual resources of the base. Trenching, removal of the existing system and replacement would occur in a step-wise progression along the flightline. After completion of the project, the only visual change would be the presence of an additional outfall structure along the Back River.

LAND USE

Under this alternative, the upgrade to the storm water system along the flightline is consistent with long-term plans for the base. Areas along Danforth Avenue would not be upgraded as planned with the proposed action. This alternative would be in accordance with the Enforceable Regulatory Programs of the Virginia Coastal Resources Management Program to the maximum extent practicable. This project would not have any component that would affect any of the following sections of the Enforceable Regulatory Program: Fisheries Management, Dunes Management, Shoreline Sanitation, and Coastal Lands Management.

4.1.3 No-Action Alternative

No impacts to transportation, visual, or land use resources are anticipated under the no-action alternative since the new construction would not occur and all existing structures and uses would remain unchanged. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.2 SOCIOECONOMICS

4.2.1 Proposed Action

Economic activity associated with the construction of the storm sewer upgrades, such as payroll and materials expenditures, would provide short-term economic benefits to the local economy during the projected 24–month period required to complete the project. It is estimated that these expenditures would support approximately 46 construction jobs and 23 secondary jobs, for a total employment effect of 79. This number of jobs represents a minor contribution to

regional employment. This impact would comprise less than 0.1 percent of regional employment and earnings. No adverse environmental consequences to socioeconomic resources would be expected.

4.2.2 Northeast Outfall Alternative

Construction activity and earnings associated with this alternative would be very similar to that of the proposed action. Therefore, no adverse environmental consequences are anticipated with the construction of the storm system at this alternative location.

4.2.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no additional economic activity generated by this alternative. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.3 CULTURAL RESOURCES

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966 empowers the Advisory Council on Historic Preservation (ACHP) to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP. Significance evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Those cultural resources determined to be significant are protected under the NHPA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts result primarily from the effects of project-induced population increases.

4.3.1 Proposed Action

Impacts to cultural resources are not expected under the proposed action. Storm water system construction would take place outside existing historic buildings. Construction of a box culvert would require removal of a 20-foot section of the former tow tank facility foundation (Building 720). This facility was recorded and demolished, except for the foundation, during a previous action (Air Force 2001b). It is no longer a contributing member of the Langley Field Historic

District and is not individually eligible for the NRHP. Construction of a new pumping station facility would require consultation and coordination with the Virginia SHPO to ensure that the new facility would be visually compatible with the overall Historic District. Correspondence with the SHPO regarding this action is included in Appendix A.

Impacts to archaeological resources are not expected because of the extent of development within the area of potential effect of the proposed action. However, the flightline area along the southern hangar line is considered to have moderate to low archaeological potential, and archaeological monitoring of ground-disturbing undertakings in this area has been recommended (USACE 1998). If unanticipated archaeological resources were encountered during construction, they would be handled in compliance with AFI 32-7065. The portion of the storm water system that would be constructed within previously excavated utility corridors would be unlikely to affect archaeological resources.

The ACC Campus area has been disturbed by repeated development and shoreline modifications, although some potential for archaeological resources could be present in the infilled and bulkheaded areas along the Back River shoreline (USACE 1998). Under the proposed action, the shoreline area would be covered with a riprap armor that could provide protection to underlying archaeological deposits, if any are present in the area. The new pumping station facility would be constructed in a previously disturbed area between the old tow tank building and the shoreline, and is unlikely to impact archaeological resources.

4.3.2 Northeast Outfall Alternative

Potential impacts to cultural resources under this alternative are expected to be similar those described for the proposed action.

4.3.3 No-Action Alternative

Under the no-action alternative, construction of a storm water system would not take place. No impacts to cultural resources are expected under this alternative. Resources would continue to be managed in compliance with AFI and federal regulations. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.4 BIOLOGICAL RESOURCES

4.4.1 Proposed Action

Under the proposed action, construction would disturb an area that is previously developed or landscaped, currently experiences high levels of continual human activity, lacks native terrestrial habitat, and exhibits a low level of biodiversity. The only plant or animal species likely to be displaced from this marginal habitat are individuals of common and locally abundant species. The overall ecological effect would therefore be insignificant.

The proposed action would not adversely impact wetlands or the wetland management program associated with the Virginia Coastal Zone Management Program.

Standard construction practices would be applied to control sedimentation and erosion during construction, thereby avoiding secondary effects to freshwater aquatic communities. With the implementation of these practices during construction, no adverse environmental consequences are anticipated.

Species listed, proposed for listing, or candidates for listing as threatened and endangered in accordance with the ESA of 1973 (87 Stat. 884, as amended; 16 USC 1531 *et seq.*) are not anticipated to be adversely affected by the proposed action. Consultation with federal (USFWS) and Commonwealth agencies (see Appendix A) has been initiated. Critical habitat for the bald eagle does not exist on base. Incidentally occurring federally listed, proposed, or candidate species are not likely to be adversely affected by the proposed action because their temporal exposure is short, no critical habitat exists on base, the area to be disturbed is of low ecological value, and the bald eagle does not use Langley AFB for nesting or other critical life cycle functions.

State-protected species would also not be adversely affected by the proposed action because their habitat would not be altered and because changes in base activities are not expected to be biologically significant. At Langley AFB, no special species or sensitive habitats would be affected.

4.4.2 Northeast Outfall Alternative

Construction of the storm sewer with the alternative alignment would have very similar environmental consequences to terrestrial, threatened, endangered, and special status species communities as associated with the proposed action. Therefore, adverse effects to individual species or native plants or animals are expected to be negligible.

There is the potential for wetlands located between Ward Road and the storm sewer alignment and at the shoreline to be disturbed with the construction of the sewer line. If this alternative were chosen, representatives of the base and the USACE would review the alignment of the storm sewer in this portion of the base and determine the best route. Any wetlands permanently disturbed would be replaced at a ratio determined by the USACE to achieve a no net loss of wetlands.

Standard construction practices would be applied to control sedimentation and erosion during construction, thereby avoiding secondary impacts to wetlands. Prior to any ground-disturbing activities at this site, a delineation of potential wetlands in the construction area would be performed, and a Section 404, Clean Water Act permit would be obtained.

4.4.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no environmental consequences to this resource. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.5 WATER RESOURCES

4.5.1 Proposed Action

With the implementation of the proposed action, storm water from the flightline and Danforth Avenue would be discharged into the Back River through a new outfall located approximately 300 feet north of the existing outfall number 7. There would be no increase in the total area drained to the Back River and the installation of a pumping station would eliminate the tidal flow into the storm water system that exists with the current storm system configuration. The pump station would also provide for better containment of spills of petroleum substances and sediments that enter the storm drainage system. These material would be trapped in the wet well and recovered, thereby not being introduced into the Back River or Chesapeake Bay. An application for a major modification to the existing VPDES permit (VA0083194) has been submitted to the VDEQ for review and approval.

Construction of the upgrades to the storm water system would be in the 100-year floodplain and would disturb approximately one acre of previously developed areas. No additional impervious surfaces would be created with the implementation of the proposed action. No fill would be placed in the 100-year floodplain except for the riprap associated with the pumping station.

Since more than one acre would be disturbed by construction, a VPDES Storm Water General Permit would be required. Under the permit, the construction contractor would obtain the permit and provide a SWPPP that describes standard construction practices to be implemented to eliminate or reduce sediment and non-storm water discharges. These control measures are outlined in Erosion and Sediment Control Handbook administered by the Virginia Department of Conservation and Recreation. With the implementation of the SWPPP and the standard practices, environmental consequences from erosion and sedimentation would be negligible. There would be no impacts to water resources from point source or non-point sources with implementation of the proposed action, and the proposed action would not conflict with point source or non-point source pollution control objectives associated with the Virginia Coastal Zone Management Program.

4.5.2 Northeast Outfall Alternative

Construction of the upgrades to the storm system under the alternative alignment would have similar environmental consequences as identified by the proposed action. A major modification to the VPDES permit would be necessary and the alternative alignment would also be in the 100-year floodplain.

4.5.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no environmental consequences to this resource. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.6 AIR QUALITY

4.6.1 Proposed Action

The air quality analysis included an assessment of direct and indirect emissions from the known activities associated with the proposed action at Langley AFB that would affect the regional air quality. The activities identified as requiring evaluation included the construction of the pump and electrical buildings, grading and trenching associated with installation of the pipeline to be used for transporting the storm water, fill material transport, and construction employee commuting. Emissions from the proposed action are either "presumed to conform" (based on emissions levels that are considered insignificant in the context of overall regional emissions) or they must demonstrate conformity with approved SIP provisions.

Emissions during the construction period were quantified to determine the potential impacts on regional air quality. These emissions were compared to federal conformity *de minimis* thresholds for O_3 precursors (VOCs and NO_x). Emissions of VOC, NO_x, CO, and PM_{10} from construction activities were calculated using emission factors from the *California Environmental Quality Act Air Quality Handbook* (South Coast Air Quality Management District 1993). These emission factors are used because they are the most comprehensive for construction activities. The emission factors included contributions from engine exhaust emissions (i.e., on-site construction equipment, material handling, and workers' travel) and fugitive dust emissions (e.g., from grading activities). The construction phase was conservatively estimated to span a 12-month period. Emissions from trucks making an estimated 2,175 round trips of 50 miles for 260 days to bring fill material to the facility were calculated using emission factors for heavy duty diesel vehicles from *Calculation Methods for Criteria Pollutant Air Pollutant Emission Inventories* (Jagelski and O'Brien 1994). The emissions, in tons per construction period, from the proposed action are presented in Table 4-1.

Table 4-1. Project Emissions – Proposed Action

Criteria Pollutants	*Langley AFB Baseline Emissions (tons per year)*	*Hampton Roads AQCR (tons per year)*	*Temporary Construction Emissions (tons)*
CO	794.69	257,325	7.4
VOCs	125.68	79,750	1.7
NO_x	293.81	83,560	7.1
SO_2	6.81	110,220	0.5
PM_{10}	13.83	49,860	3.2

Total construction emissions generated on base and within the Hampton Roads AQCR are less than one percent when compared to regional emissions and are below the 100 tons per year *de minimis* federal conformity thresholds for NO_x and VOCs. Emissions generated by construction projects are temporary in nature and would end when construction is complete. The emissions from fugitive dust (PM_{10}) would be significantly less due to the implementation of control measures in accordance with standard construction practices. For instance, frequent spraying of water on exposed soil during construction, proper soil stockpiling methods, and prompt replacement of ground cover or pavement are standard landscaping procedures that could be used to minimize the amount of dust generated during construction. Using efficient grading practices and avoiding long periods where engines are running at idle may reduce combustion emissions from construction equipment. Vehicular combustion emissions from construction worker commuting may be reduced by carpooling.

Direct operational emissions from the proposed project would be associated with operation of a diesel-fired emergency generator. No additional emissions are anticipated from personnel traveling, since the personnel are already employed at Langley. Emissions from the 1,000-kilowatt emergency generator would be minimal, as the operations are expected to be less than 100 hours per year. No changes to the Synthetic Minor Operating permit issued by VDEQ Title V program are anticipated. Relative to overall base emissions, the proposed project would result in minor increases in criteria pollutants at the base.

General conformity regulations set forth in 40 CFR 51 Subpart W, and adopted in the Virginia Administrative Code (9 VAC 5 Chapter 160), outline *de minimis* levels of emissions, below which it is presumed that the action conforms to the SIP. The *de minimis* levels for O_3 precursors in a maintenance area outside of an O_3 transport region (i.e., Hampton Roads AQCR) are 100 tons per year of VOCs emissions and 100 tons per year of NO_x. In addition, the proposed action's emissions (both direct and indirect) must be compared to the regional inventory to determine if the emissions are "regionally significant." Emission increases of O_3 precursors (NO_x and VOCs) are well below the threshold thus demonstrating compliance with CAA conformity requirements. In addition, the proposed action emissions are well below the

regional significance threshold defined by 10 percent of the regional emissions (i.e., 836 tons per year of NO_x and 797 tons per year of VOCs).

4.6.2 Northeast Outfall Alternative

Estimated emissions as a result of the implementation of this alternative would be less than the proposed action as a result of the shorter route. The emissions would be below *de minimis* levels (the ROI is in attainment of the federal and state standards); therefore a conformity analysis would not be necessary. In addition, proposed demolition and construction activities would be short-term in nature; no long-term increases in emissions would occur, as no new stationary sources would be constructed. Therefore, implementation of this alternative would not result in adverse environmental consequences to air quality within the ROI.

4.6.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no environmental consequences to this resource. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.7 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

4.7.1 Proposed Action

Construction of the new pumping station and storm sewer may require the use of hazardous materials by contractor personnel. In accordance with the base's HAZMART procedure, copies of Material Safety Data Sheets must be provided to the base and maintained on the construction site. The base would maintain any hazardous materials used by base personnel in the operation of the center and no adverse environmental consequences are anticipated.

Contractor personnel may generate hazardous waste, such as paints, adhesives, and batteries, during the construction. Storage and disposal of these wastes would be the responsibility of the contractor and the base's hazardous waste program. Appreciable amounts of hazardous wastes would not be generated by base personnel during the operation and maintenance of the proposed pumping station and no adverse environmental consequences are expected.

Any soils or groundwater suspected of contamination, as discovered during the construction process, would be tested and disposed of in accordance with proper regulations. Project contractors would comply with federal, state, and local environmental laws and would employ affirmative procurement practices when economically and technically feasible.

Construction of the proposed action could potentially have some adverse impact on ERP Site ST-27 Danforth Fuel Line Leaks. Coordination with the 1 CES Environmental Restoration

Branch would be done prior to any site preparation or construction to assure that any necessary waivers, manifests, approvals and/or permits are in-place. Any contaminated material encountered during construction would be removed and properly disposed of.

During construction, portions of the aircraft aprons, roads, parking lots, and curbing would be demolished. As possible, concrete, asphalt and metal debris would be recycled, with all other materials being disposed of as solid waste. Operation of the pumping station is not anticipated to generate solid waste. No adverse environmental consequences associated with solid waste management would be expected with the implementation of the proposed action.

4.7.2 Northeast Outfall Alternative

Under this alternative, the use of hazardous materials and the generation of hazardous wastes would be the same as the proposed action. This alignment passes near an abandoned wastewater treatment plant (ERP Site WP-02). However, ERP Site WP-02 would not be impacted. Other environmental impacts associated with this site would be the same as for the proposed action.

4.7.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no environmental consequences to this resource. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.8 SAFETY

4.8.1 Proposed Action

The proposed action would require the placement of approximately of 11,000 cubic yards of fill material and the construction of a new 900 square foot building. Implementation of this action would result in a short-term increase in the risks associated with construction and demolition, however no adverse environmental consequences are anticipated. Standard construction practices and OSHA regulations would be followed.

4.8.2 Northeast Outfall Alternative

With the implementation of this alternative, potential impact to safety would be similar to those described under the proposed action. Implementation of this action would result in a short-term increase in the risks associated with construction and demolition, however no adverse environmental consequences are anticipated. Standard construction practices and OSHA regulations would be followed.

4.8.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. There would be no environmental consequences to this resource. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

4.9 NOISE

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a proposal. Potential changes in the noise environment can be (1) beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels); (2) negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged); or (3) adverse (i.e., if they result in increased exposure to unacceptable levels).

4.9.1 Proposed Action

Implementation of the proposed action would have minor, temporary increases in localized noise levels in the vicinity of the project area during construction. The base is an active military facility that typically experiences high noise levels from daily flight operations. Use of heavy equipment for site preparation and development (i.e., grading, fill, and construction) would generate noise. However, noise would be similar to typical construction noise, last only the duration of the specific construction activities, and could be reduced by the use of equipment sound mufflers and restricting construction activity to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Compared with aircraft noise, noise produced by construction would generally be more impulsive, relatively lower in magnitude, and spread out during the day. Noise from truck traffic hauling fill to the site could affect base personnel living along Sweeney Boulevard because of the potential use of Sweeney Boulevard as a haul route for fill and other construction materials. The noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant.

4.9.2 Northeast Outfall Alternative

Under this alternative, noise impacts would be similar to those identified for the proposed action. Heavy equipment and construction activity would cause temporary noise along the construction location. There are no sensitive receptors (e.g., day care facilities) in the immediate area that would be affected by construction noise. Individuals, such as joggers, using the area east of Ward Road during construction activities would experience higher noise levels. These would be short-term impacts and noise exposure would return to existing levels, which are dominated by aircraft over flights. No significant noise impacts would occur.

4.9.3 No-Action Alternative

Under the no-action alternative, the upgrade to the storm water system would not be constructed and storm drainage would continue using existing facilities that do not meet current design criteria. Noise levels would remain the same as they are currently. Flooding would continue to occur along the flightline and within the drainage system of Danforth Avenue during storm events.

5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE EFFECTS

This section provides (1) a definition of cumulative effects, (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects, and (3) an evaluation of cumulative effects potentially resulting from these interactions.

5.1.1 Definition of Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in *Considering Cumulative Effects* affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographic and temporal overlaps among the proposed action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with, or in close proximity to, the proposed action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA addresses three questions:

1. Does a relationship exist such that elements of the proposed action might interact with elements of past, present, or reasonably foreseeable actions?

2. If one or more of the elements of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?

3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

In this EA, an effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and

the actions have a potential to interact with the proposed action in this EA, these actions are included in this cumulative analysis. This approach enables decisionmakers to have the most current information available so that they can evaluate the environmental consequences of the proposed action.

5.1.2 Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide decisionmakers with not only the cumulative effects of the proposed action, but also the incremental contribution of past, present, and reasonably foreseeable actions.

PAST AND PRESENT ACTIONS RELEVANT TO THE PROPOSED ACTION

Langley AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States defense policy that the Air Force must be ready to respond to threats to American interests throughout the world. In 1998, the Air Force implemented a force structure change that added 12 F-15C aircraft and 134 personnel to Langley AFB, increasing the total number of F-15C aircraft to 66. Recently, the base completed establishing a Combined Air Operations Center-Experimental and the beddown of the Aerospace Expeditionary Force Center.

The base, like any other major institution, also requires new occasional construction, facility improvements, and infrastructure upgrades. Langley AFB is currently upgrading portions of its water and wastewater system and has recently completed a new library and water tower. Currently a new fitness center, a dormitory complex, and various F/A-22 facilities are under construction and the Langley Tow Tank (Building 720) has been demolished.

INCREMENTAL IMPACTS OF THE PROPOSED ACTION WITH REASONABLY FORESEEABLE FUTURE ACTIONS

During the timeframe FY 02 to FY 06, Langley AFB has proposed a number of actions that are independent of the proposed action and would be implemented irrespective of a decision on the upgrades to the proposed storm water system. Construction programs include a new water tower ($1.3 million in 2003), family housing ($5.6 million in 2003), privatizing family housing ($17 million in 2003), a new housing office ($1.2 million in 2003), and a youth center ($5 million in 2004). In addition to these ongoing infrastructure improvements, Langley AFB has been selected for the beddown of the Initial Operational Wing of the new F/A-22 aircraft. The majority of the proposed projects associated with the F/A-22 beddown at Langley AFB would be constructed along the flightline and have the potential to disturb approximately 16 acres.

5.1.3 Analysis of Cumulative Impacts

The following analysis examines how the impacts of these other actions might be affected by those resulting from the proposed action at Langley AFB and whether such a relationship

would result in potentially significant impacts not identified when the proposed action is considered alone.

A previous EA for the implementation of a force structure change at Langley AFB and the construction of the new water tower did not identify any significant environmental consequences (Air Force 1998b, 2001e). The result of the force structure change left Langley AFB operating at levels below those occurring in the early 1990s. The establishment of a Combined Air Operations Center-Experimental and the beddown of the Aerospace Expeditionary Force Center, while adding a total of 122 new personnel, qualified for categorical exclusions because no new construction was required to support the actions. The demolition of the Langley Tow Tank (Building 720) has been evaluated and would generate truck traffic at the West Gate that might overlap with the construction truck traffic from the Fitness Center. This construction traffic would be completed before the start of construction of the proposed action.

Langley AFB has been selected for the beddown of the Initial Operational Wing of F/A-22. Construction at Langley AFB would impact the architectural and visual aspects of the Langley Historic District. Given that the F/A-22 construction would have a minimal effect on noise, air quality, and traffic, the combined environmental consequences of these actions would remain well below the threshold of significance for these resources.

Although not fully analyzed at this time, none of the future infrastructure actions (analyzed in separate environmental documents) would be expected to result in more than negligible impacts either individually or cumulatively. All actions affect very specific, circumscribed areas, and the magnitude of the actions is minimal. The recent analysis of traffic effects in the *Intell Campus/OSC Traffic Impact Assessment* (Military Traffic Management Command 2001) indicates that, with the completion of dormitory projects through 2007, all traffic movements on Elm Street, Nealy Avenue, and Rickenbacker Road would be at an acceptable level of service. This analysis was completed prior to the initiation of this project, however if the peak construction periods of the Operational Support Center, the dormitory projects and this proposed action overlapped, then occasional delays would be anticipated, however no adverse effect is expected.

Storm water runoff from the dormitory projects would be managed by a set of retention ponds and thereby control the level of sediment and nutrients discharging to the Back River. Given that the proposed action would likewise have a minimal effect within the base, the combined impacts of these actions would remain well below the threshold of significance for any resource category.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of ". . . any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use

of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the demolition of a historic building).

For the proposed action, most resource commitments are neither irreversible nor irretrievable. Most environmental consequences are short-term and temporary (such as air emissions from construction) or longer lasting but negligible (e.g., utility increases). Those limited resources that may involve a possible irreversible or irretrievable commitment under the proposed action are discussed below.

Construction of the upgrades to the storm water system would require consumption of limited amounts of materials typically associated with interior and exterior construction (e.g., concrete, wiring, insulation, and windows). The amount of these materials used is not expected to significantly decrease the availability of the resources.

6.0 REFERENCES

Barrera, J.F. 1995. Survey for Bald Eagles and Peregrine Falcons at Langley Air Force Base, Virginia. Report for Air Combat Command. July 1995.

Brewer, M. 2001. Floodplain Map. Langley Air Force Base, Virginia.

City of Newport News. 2000. http://www.newport-news.va.us/owdept/ww/index.htm. Newport News, Virginia.

Ecology and Environment, Inc., and Jacobs Engineering Group. 1999. Public Water Supply Cross-Connection Study, Backflow Prevention Device Testing, and Program Database. October 1999.

Hobson, C.S. 1996. A Natural Heritage Inventory of Langley Air Force Base, Virginia. Natural Heritage Technical Report 96-9. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. Unpublished report submitted to Air Combat Command, 1st CES/CEV, Langley Air Force Base, Virginia. March 1996.

Jagelski, K. and J. O'Brien. 1994. Calculation Methods for Criteria Air Pollution Emission Inventories. U.S. Air Force, Armstrong Laboratory, AL/OE-TR-1994-0049, Brooks Air Force Base.

Military Traffic Management Command. 1996. Traffic Engineering Study. Langley Air Force Base, Virginia. Transportation Engineering Agency. March 1996.

_____. 2001. Intell Campus/OSC Traffic Impact Assessment. Langley Air Force Base, Virginia. Transportation Engineering Agency. December 2001.

South Coast Air Quality Management District. 1993. CEQA Air Quality Handbook.

United States Air Force (Air Force). 1998a. Integrated Natural Resource Management Plan, Langley Air Force Base, Virginia. June 1998.

_____. 1998b. Final Environmental Assessment for Proposed Force Structure Change at Langley Air Force Base, Virginia. Agency Report. Langley Air Force Base, Air Combat Command. November 1998.

_____. 1999a. FY 1999 Economic Impact Analysis, Langley Air Force Base, Virginia. 1999.

_____. 1999b. Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (AFIERA). IERA-RS-BR-SR-1999-0001. May 1999.

_____. 2000a. Storm Water Pollution Prevention Plan. Langley Air Force Base. April 2000.

_____. 2000b. 1998 Air Emissions Inventory for Langley Air Force Base. Langley Air Force Base, Virginia.

_____. 2001a. Initial F-22 Operational Wing Beddown. Final Environmental Impact Statement. Air Combat Command, Langley Air Force Base, Virginia.

_____. 2001b. Environmental Assessment. Demolition of the Langley Tow Tank Facility ("Mile Long Building"). Langley Air Force Base, Virginia.

_____. 2001c. Final Wetlands Report, Langley Air Force Base, Commonwealth of Virginia. April 2001.

_____. 2001d. Final Environmental Assessment, Shoreline Stabilization at the Lighter-Than-Air Area Pool and Sewage Pump Station, Langley Air Force Base, Virginia. June 2001.

_____. 2001e. Final Environmental Assessment of the Installation of a Water Tower at Langley Air Force Base, Virginia. Langley Air Force Base, Virginia.

_____. 2002. Environmental Restoration Program Management Action Plan, Langley Air Force Base, Virginia. December 2002.

U.S. Army Corps of Engineers (USACE). 1998. Langley Air Force Base Langley Field Historic District Cultural Resource Management Plan, Volumes I and II. U.S. Air Force, Air Combat Command.

_____. 2000. Demolish Mile-Long Building 720A/B. Langley Air Force Base, Virginia, Scope of Work. Includes two reports by Dominion Environmental Group, Inc.: Asbestos-Containing Material & Lead-Based Paint Survey Report, Langley Air Force Base, Mile-Long Building, Hampton, Virginia; and Soil Sampling (Lead, Asbestos and Petroleum), Mile-Long Building, Hampton, Virginia. April.

_____. 2001. Langley Air Force Base Storm Water Study for the U.S. Army Corps of Engineers, Norfolk District, August 2001.

United States Department of Commerce, Economics and Statistics Administration (USDCESA). 2000. Regional Economic Information System 1969-99. Bureau of Economic Analysis. June 2000.

United States Environmental Protection Agency (USEPA). 1998. Office of Air Quality Planning and Standards. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition Volume 1, Stationary and Area Sources, Section 11.9, Minerals Products Industry, Clearinghouse for Inventories and Emission Factors (CHIEF).

_____. 2000. Memorandum. Subject: Boundary Guidance on Air Quality Designations for the 8-hour Ozone National Ambient Air Quality Standard (NAAQS). John Seitz, Director Office of Air Quality Planning and Standards (OAQPS). March 28, 2000.

_____. 2002a. Air Quality Data Update, 1999-2001 Ozone Air Quality Data. Downloaded from website on 18 November 2002. http://www.epa.gov/airtrends/data/AQupdate2001.pdf

_____. 2002b. List 3: Counties with Monitors But Insufficient [PM2.5] Data. Downloaded from USEPA website on 18 November 2002. http://www.epa.gov/airtrends/data/ANNUAL%20STD%20DV%20ALL%20COU.pdf

Virginia Marine Resources Commission. 2003. Map #270-2620, Lease #5763. Newport News. February 2003.

PERSONS AND AGENCIES CONTACTED

Bolter, Rob. 2003. Virginia Marine Resources Commission, Newport News, Virginia.

Evans, J. 2001. U.S. Army Corps of Engineers, Norfolk District, Virginia.

Wittkamp, Thomas. 25 June 2001. 1 CES, Langley Air Force Base, Virginia.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0 LIST OF PREPARERS

David M. Dischner, Project Manager
B.A., Urban Affairs, Virginia Polytechnic Institute and State University, Blacksburg, 1974
Hazardous Materials Management Certificate, University of California, Riverside, 1988
Years of Experience: 28

Jerry Dougherty, Hazardous Materials/Hazardous Waste
B.S., Civil Engineering, New Mexico State University, 1960
M.S., Civil Engineering, University of Oklahoma, 1972
Years of Experience: 29

Claudia A. Druss, Cultural Resources
B.A., University of Colorado, Boulder, 1977
M.A., Anthropology, Idaho State University, Pocatello, 1980
Years of Experience: 20

Sheri Freemuth, Land Use Resources
B.A., Political Science, Scripps College, 1982
M.C.P., City Planning, San Diego State University, 1985
Certified Planner, American Institute of Certified Planners, 1996
Years of Experience: 17

David Lingner, Air Quality
B.S., Chemistry & Mathematics, Bates College 1978
Ph.D., Chemistry, Purdue University 1985
Years of Experience: 20

Robert E. Van Tassel, Program Manager
B.A., Economics, University of California, Santa Barbara, 1970
M.A., Economics, University of California, Santa Barbara, 1972
Years of Experience: 25

Kimberly Freeman, Production Manager
Years of Experience: 16

Claudia Laughlin, Graphics
Years of Experience: 6

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A
CONSULTATION LETTERS

Science Applications International Corporation
An Employee-Owned Company

11 February 2003

Dear Sirs:

The U.S. Air Force is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the upgrade to the storm water system servicing the flight line area at Langley AFB, Virginia. Two alternatives, shown on the attached figure (Attachment 1), are being considered for the construction of the upgrade to the storm water system.

Pursuant to the Endangered Species Act and the National Environmental Policy Act we must consider potential impacts of the proposed action to federally listed threatened, endangered, candidate and proposed to be listed species that occur or may occur in the potentially affected area. We have received species information from various federal and state offices recently and would like to confirm these lists (see Attachment 2) with your office. Please provide your response to: SAIC, Storm EA-Dischner, 22 Enterprise Parkway, Suite 200, Hampton VA 23666. Until the extent of the potential impact to listed species is determined, we will make no decision regarding the need for a section 7 consultation.

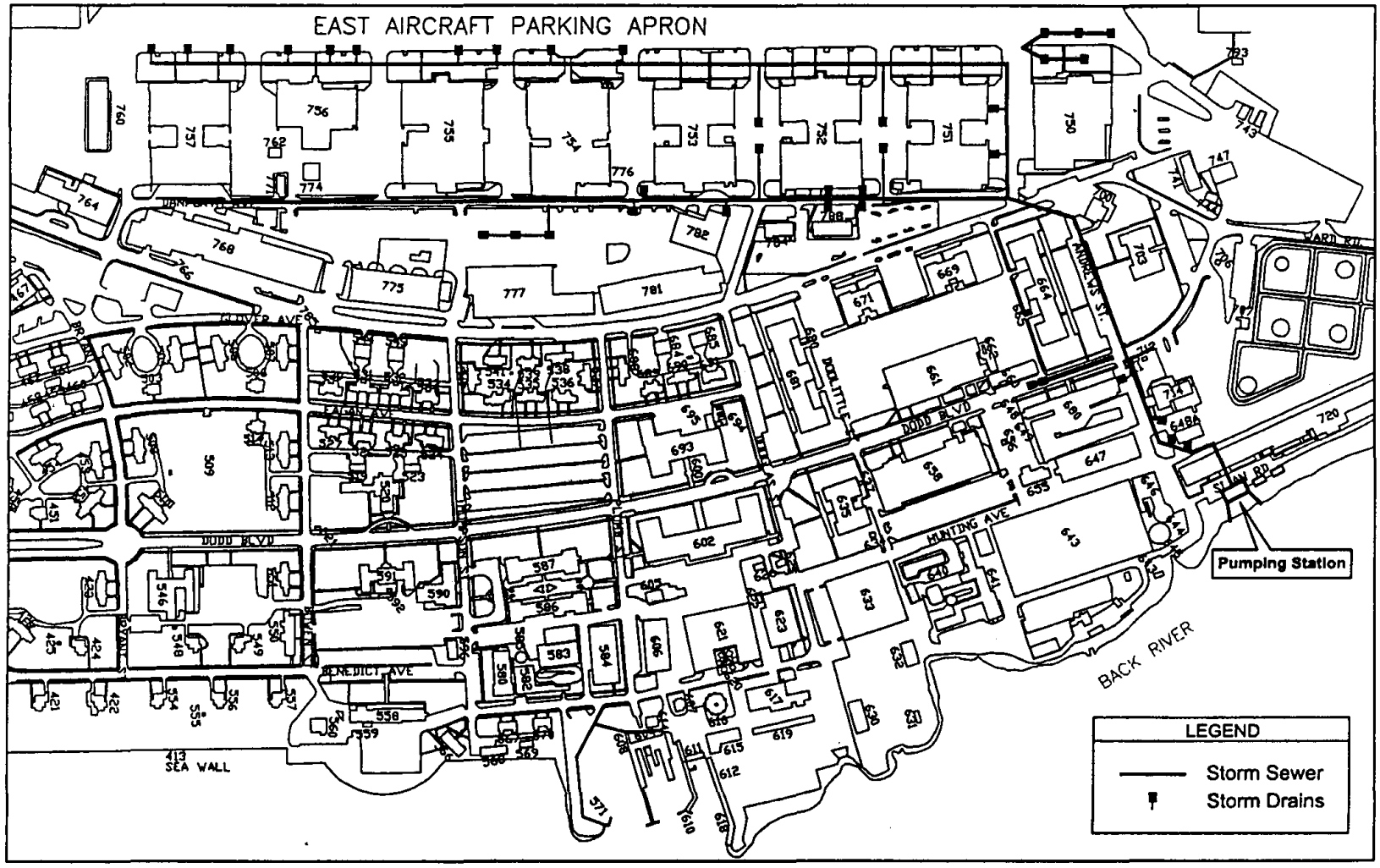
Sincerely,

Science Applications International Corporation

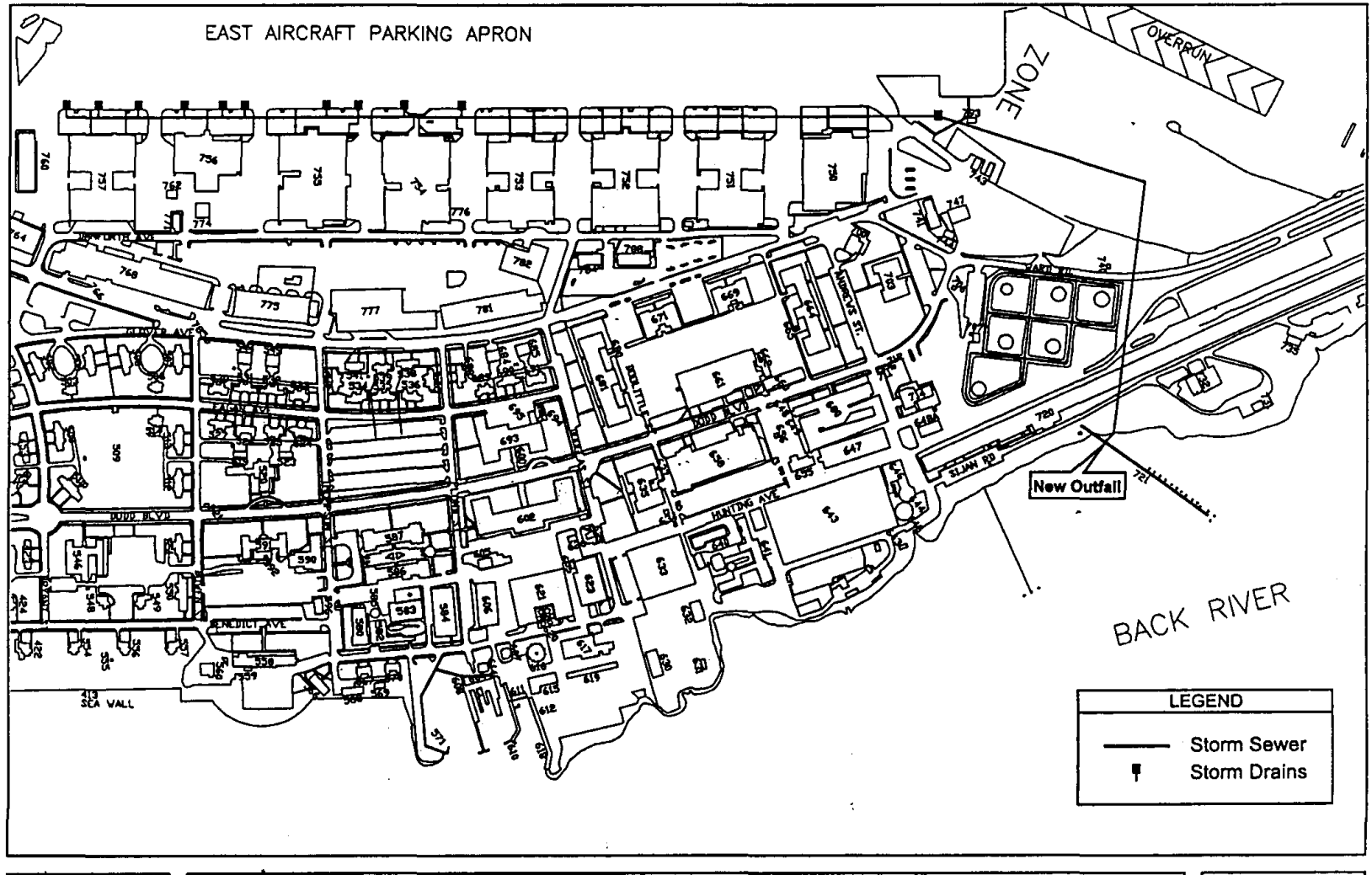
David Dischner
Project Manager

Attachments:
1. Potential Project Locations
2. Threatened and Endangered Species List
3. Distribution List

22 Enterprise Parkway, Suite 200, Hampton, Virginia 23666 • (757) 825-6334 • Fax: (757) 825-9104
Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson



Proposed Action,
Upgrade of Storm Water System, Langley AFB, Virginia



Northeast Outfall Alternative,
Upgrade of Storm Water System, Langley AFB, Virginia

Table 3-1. Threatened, Endangered, and Special-Status Species/ Communities that Occur or Potentially Occur on Langley AFB

Species	*Status*	*Areas of Occurrence*
Plants		
Harper's fimbristylis *Fimbristylis perpusill*	SE	Coastal seasonal ponds.
Virginia least trillium *Trillium pusillum var. virginianum*	FSC	Forested wetlands and mesic woods including the "green sea" wetlands. Recorded from the City of Hampton.
Invertebrates		
Northeastern beach tiger beetle *Cicindela dorsalis dorsalis*	FT	Broad beaches with well-developed sand dunes.
Amphibians		
Barking treefrog *Hyla gratiosa*	ST	Breeds in coastal seasonal freshwater ponds. Needs fish-free breeding habitat. Base at northern edge of range. Spends warm months in treetops, seeks moisture during dry periods by burrowing among tree roots and clumps of vegetation.
Mabee's salamander *Ambystoma mabeei*	ST	Breeds in coastal seasonal freshwater ponds. Needs fish-free breeding habitat. Tupelo and cypress bottoms in pine woods, open fields, and lowland deciduous forest.
Reptiles		
Canebrake rattlesnake *Crotalus horridus atricaudatus*	SE	Meadows, canebrake or "green sea" wetlands. At risk because of wetland loss. Swampy areas, canebrake thickets, and floodplains.
Birds		
Bald eagle *Haliaeetus leucocephalus*	FT/SE	Forages occasionally on base. Nests within three miles of the base.
Foster's tern *Sterna forsteri*	SS	Coastal and marshland bird that fishes the waters of the region.
Glossy ibis *Plegadis falcinellus*	SS	Wades in marshes and fishes the waters of the region.
Great egret *Asmerodius albus*	SC	Palustrine and estuarine wetlands; marshes.
Night-heron yellow-crowned *Nyctanassa violacea violacea*	SS	Wades in marshes and fishes the waters of the region.
Northern harrier *Circus cyaneus*	SS	Hunts over marshes and fields and is known to nest in the area.
Least tern *Sterna antillarum*	SS	Found feeding or nesting on beaches in the area.
Peregrine falcon *Falco peregrinus*	SE	Observed foraging over salt marshes on base. Open wetlands near cliffs.
Piping plover *Charadrius melodius*	FT/ST	Prefers areas with expansive sand or mudflats (for foraging) in close proximity to a sand beach (for roosting). Fifty-two designated critical habitat units from North Carolina south to northern Florida along mainland beaches and barrier islands.

Notes: FSC = Federal Species of Concern
FT = Federal Threatened
SC = State Candidate
SE = State Endangered
SS= State Sensitive
ST = State Threatened

Distribution List.

Ms. Cindy Schultz
US Fish & Wildlife Service
Virginia Field Office
6669 Short Lane
PO Box 99
Gloucester, VA 23061

Environmental Services Section
Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, VA 23230-1104

Division of Natural Heritage
Virginia Department of Conservation and Recreation
217 Governor's Street, 3rd Floor
Richmond, VA 23219

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 1ST FIGHTER WING
LANGLEY AIR FORCE BASE VA

1 CES/CC
37 Sweeney Blvd
Langley AFB VA 23665-2101

Ms. Susan Smead
State Historic Preservation Office
2801 Kensington Avenue
Richmond VA 23221

Dear Ms. Smead

The 1st Civil Engineer Squadron (1 CES) at Langley AFB has programmed a project to construct a new sewer pump house complex as part of a storm sewer upgrade on Langley AFB. The proposed complex and the sewer system upgrade project work area are located within the Heavier-Than-Air area of the Langley Field Historic District. The map at Attachment 1 shows the location of the proposed complex and project work area.

In accordance with 36 CFR 800.9, we have applied the Criteria of Effect and Adverse Effect to this undertaking and found that there will be No Adverse Effect on historic properties. The sewer pumphouse complex will include the pump house building itself, a separate electrical building, a generator and a fuel tank pad. The pumphouse building and electrical room will be constructed of brick with metal roofs. A design of the proposed buildings can be seen at Attachment 2. The entire pumphouse complex is located in a particularly industrial area of the historic district near the location of the recently demolished Mile Long Building. The construction of the buildings will not impact any of the surrounding structures. An aerial photo showing the proposed site of the pumphouse can be seen at Attachment 3.

In addition, the upgrade of the sewer system will include excavation in the areas shown on the site plan. In the event that a previously identified historic property is discovered in the area of potential effect during any ground disturbing activities, Langley AFB shall follow all guidelines set out in 36 CFR 800.13(b).

We trust that you will find this submittal consistent with the Criteria for No Adverse Effect. Please feel free to contact me should you have any questions. I can be reached at (757) 764-2696, or by e-mail at suzanne.allan@langley.af.mil. If we do not hear from you within 30 days after your receipt of this letter, we will assume that you do not object to our determination, and will proceed with the undertaking in accordance with the enclosed plans.

Thank you for your consideration in this matter.

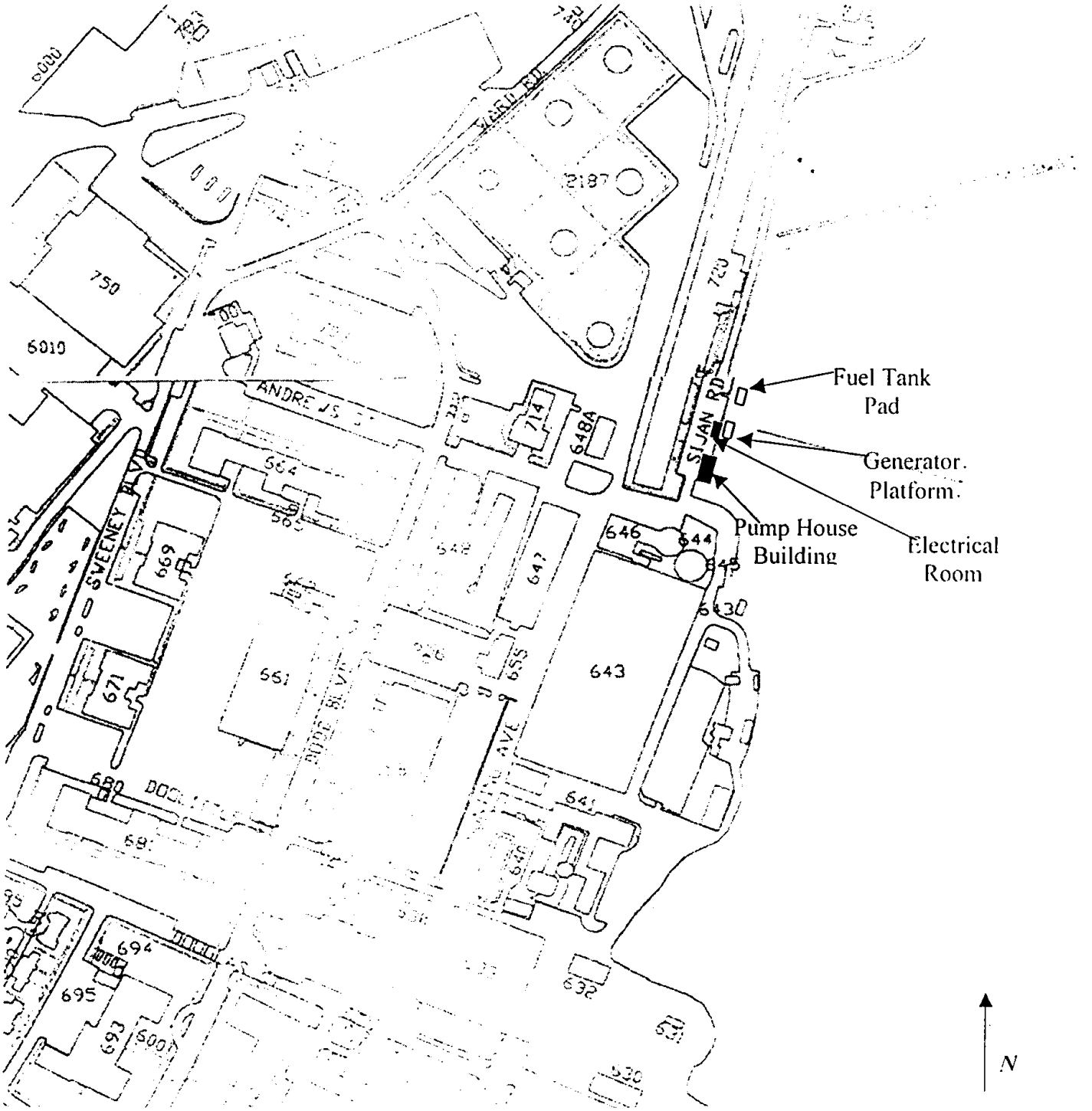
Sincerely

SUZANNE P. ALLAN
Base Cultural Resources Manager

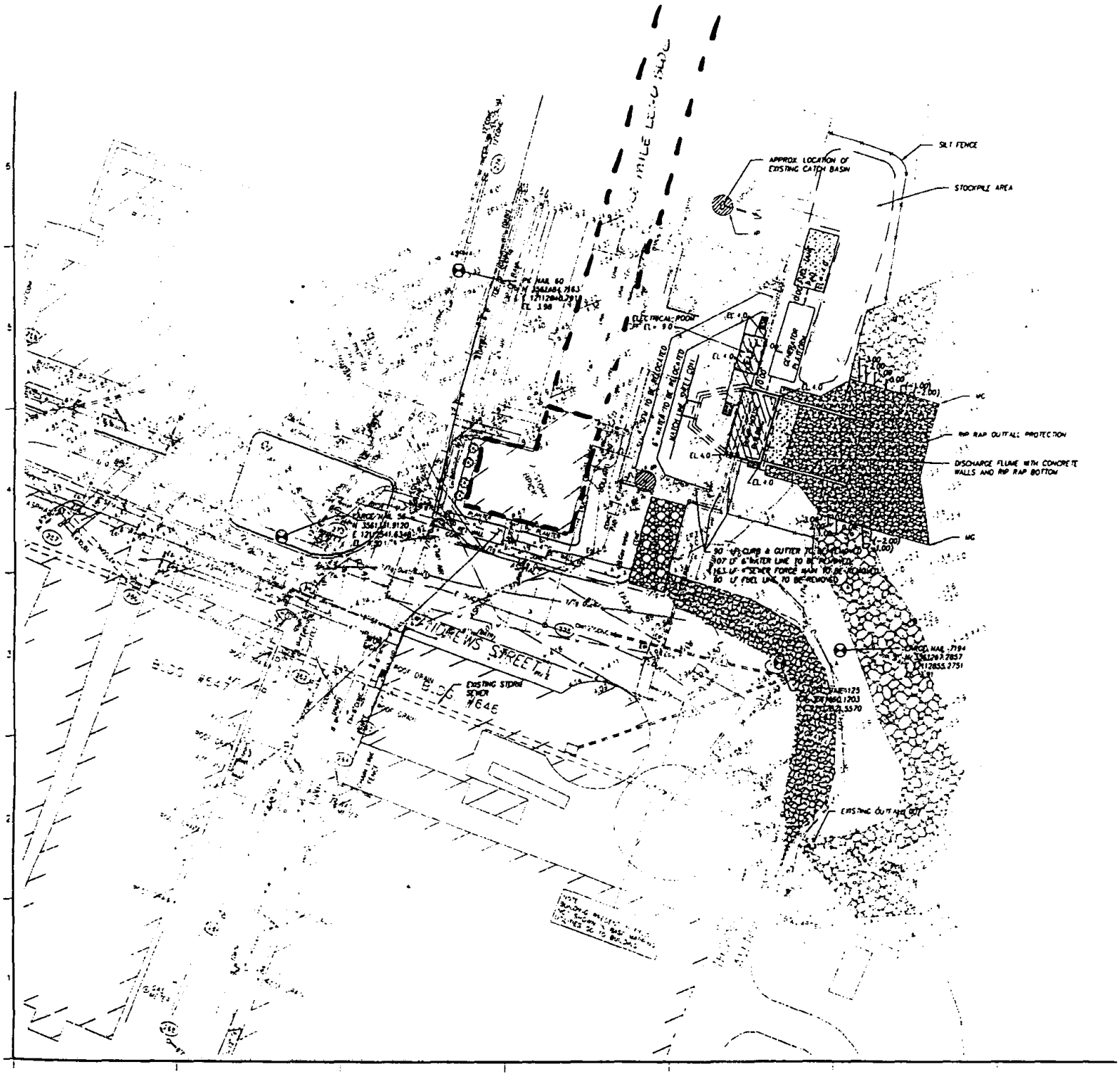
Attachments:
1. Location Map
2. Building Design Drawings
3. Aerial Photo

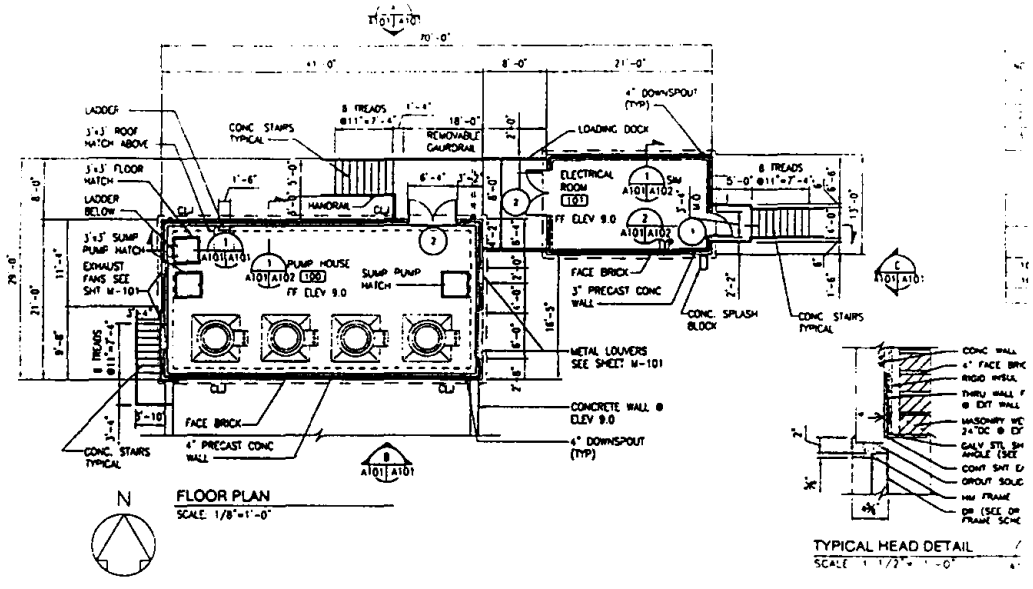
Concur: _____ Date: _____
KATHLEEN S. KILPATRICK
Director and State Historic Preservation Officer for the Commonwealth of Virginia

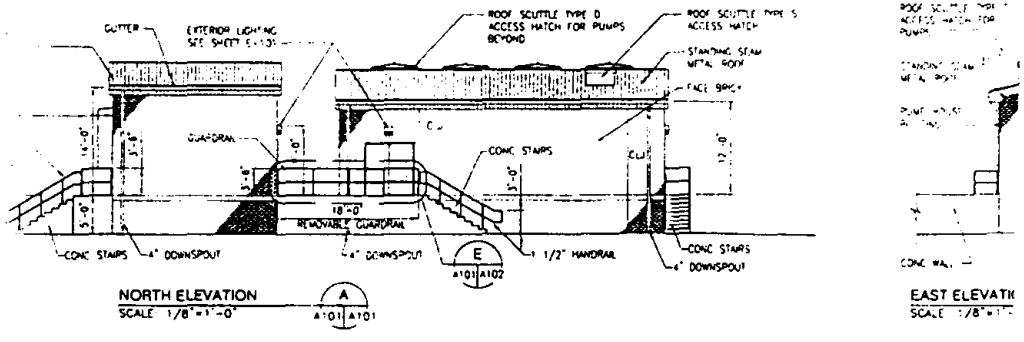
Proposed Site Plan:
F-22 Storm Sewer Pumphouse Facility

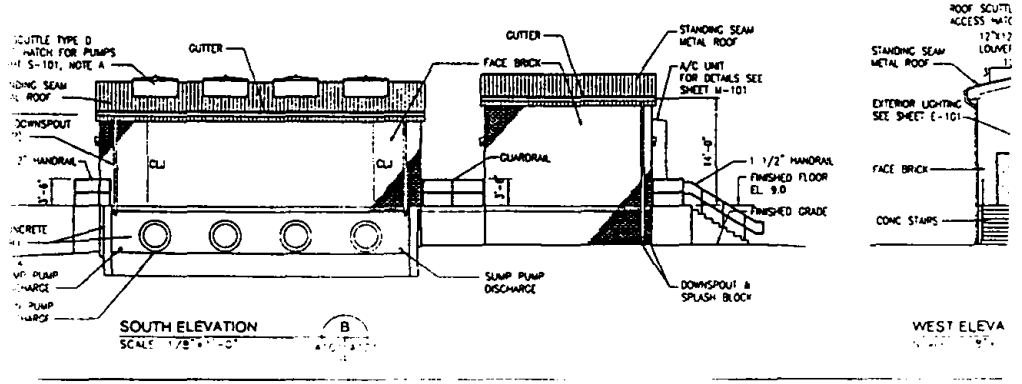


Items not drawn to scale

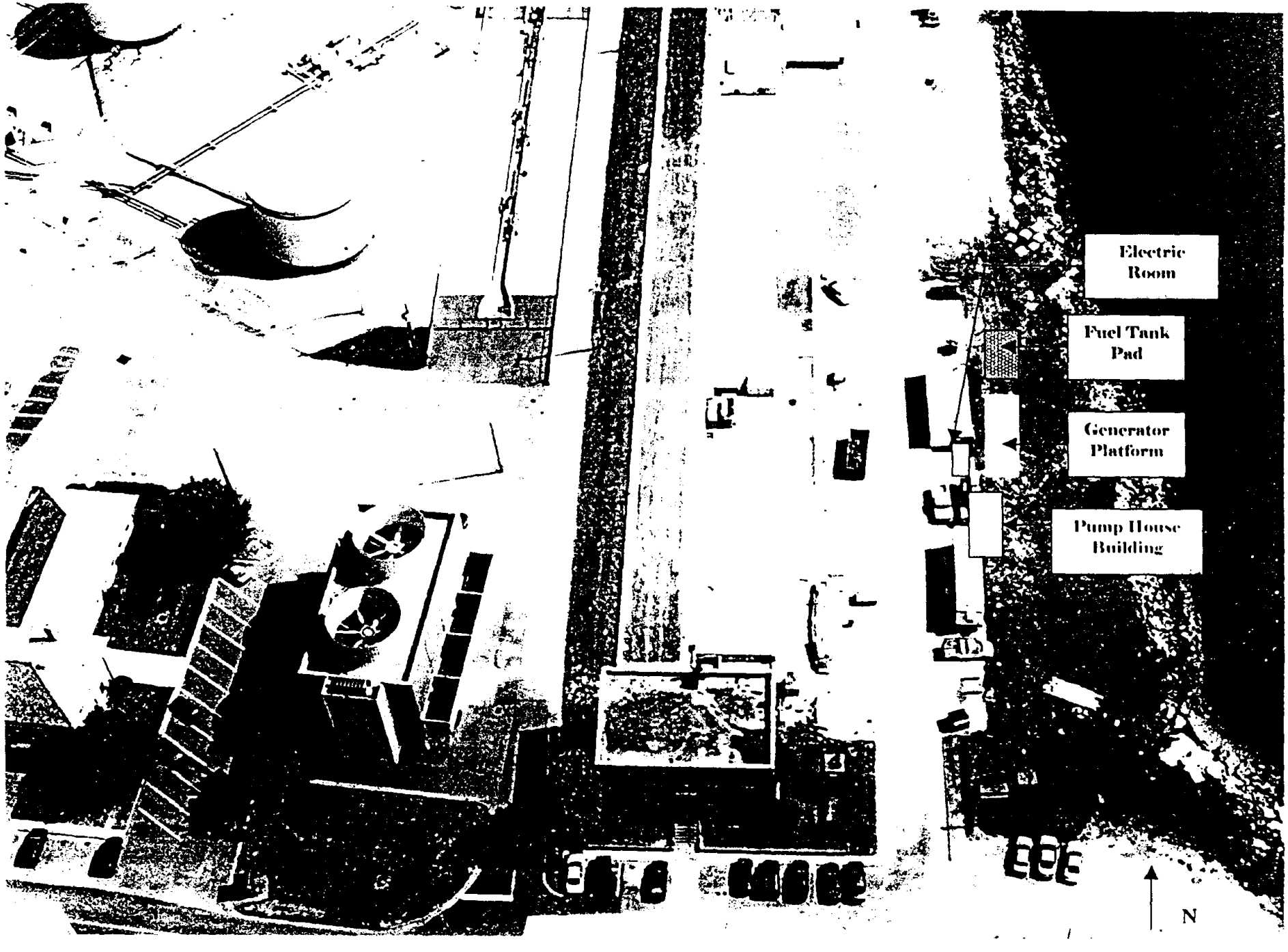

SILT FENCE
APPROX. LOCATION OF EXISTING CATCH BASIN
STOCKPILE AREA
ELECTRICAL POOP
EL. 4.0
MC
RIP RAP OUTFALL PROTECTION
DISCHARGE FLUME WITH CONCRETE WALLS AND RIP RAP BOTTOM
MC
EXISTING STORM SEWER
EXISTING OUTFALL
BLDG #646


LADDER
3'x3' ROOF HATCH ABOVE
3'x3' FLOOR HATCH
LADDER BELOW
3'x3' SUMP PUMP HATCH
EXHAUST FANS SEE SHT M-101
CONC STAIRS TYPICAL
8 TREADS @11"=7'-4"
18'-0" REMOVABLE GUARDRAIL
4" DOWNSPOUT (TYP)
LOADING DOCK
ELECTRICAL ROOM 101
FF ELEV 9.0
HANDRAIL
PUMP HOUSE 100
SUMP PUMP HATCH
FACE BRICK
3" PRECAST CONC WALL
CONC. SPLASH BLOCK
METAL LOUVERS SEE SHEET M-101
CONCRETE WALL @ ELEV 9.0
CLJ
N
FLOOR PLAN
SCALE 1/8"=1'-0"
TYPICAL HEAD DETAIL
SCALE 1 1/2"=1'-0"


GUTTER
EXTERIOR LIGHTING SEE SHEET E-101
ROOF SCUTTLE TYPE D ACCESS HATCH FOR PUMPS BEYOND
ROOF SCUTTLE TYPE S ACCESS HATCH
STANDING SEAM METAL ROOF
FACE BRICK
GUARDRAIL
CONC STAIRS
18'-0" REMOVABLE GUARDRAIL
CONC STAIRS
4" DOWNSPOUT
1 1/2" HANDRAIL
NORTH ELEVATION
SCALE 1/8"=1'-0"
EAST ELEVATI
SCALE 1/8"=1'-0"


GUTTER
FACE BRICK
STANDING SEAM METAL ROOF
A/C UNIT FOR DETAILS SEE SHEET M-101
GUARDRAIL
1 1/2" HANDRAIL
FINISHED FLOOR EL. 9.0
FINISHED GRADE
CLJ
SUMP PUMP DISCHARGE
DOWNSPOUT & SPLASH BLOCK
SOUTH ELEVATION
SCALE 1/8"=1'-0"
STANDING SEAM METAL ROOF
EXTERIOR LIGHTING SEE SHEET E-101
FACE BRICK
CONC STAIRS
WEST ELEVA

Proposed F/A-22 Pump House Complex



COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

February 19, 2003

SAIC
Storm EA – Dischner
22 Enterprise Parkway Suite 200
Hampton, Virginia 23666

RE: ESSLOG #18567, Storm water handling, Langley AFB

Dear Mr. Dischner:

This letter is in response to your request for information related to the presence of threatened or endangered species in the vicinity of the above referenced project.

The *state endangered* canebrake rattlesnake (*Crotalus horridus*) has been documented in the project area. The applicant should coordinate with this Department to evaluate potential impacts to this species.

In addition, the project is adjacent to a stream reach with a documented occurrence of American shad (*Alosa sapidissima*). The applicant should coordinate with this Department to evaluate potential impacts to this species.

The project also lies within one mile of waterbird colonies containing documented occurrences of yellow-crowned night-heron (*Nyctanassa violacea*) and great egret (*Ardea alba*). The applicant should coordinate with this Department and with the U.S. Fish and Wildlife Service to evaluate potential impacts to these colonies.

Finally, the *federal species of concern* northern diamond-backed terrapin (*Malaclemys terrapin*) has been documented in the project area. "Federal species of concern" is not a legal designation and no coordination is required at this time

Information about fish and wildlife species was generated from our agency's computerized Fish and Wildlife Information System, which describes animals that are known or may occur in a particular geographic area. Field surveys may be necessary to determine the presence or absence of some of these species on or near the proposed area. Also, additional sensitive animal species may be present, but their presence has not been documented in our information system.

Endangered plants and insects are under the jurisdiction of the Virginia Department of Agriculture and Consumer Services, Bureau of Plant Protection. Questions concerning sensitive plant and insect species occurring at the project site should be directed to Keith Tignor at (804) 786-3515.

There is a processing charge of $25.00 for our response. Please remit a check, made payable to **TREASURER OF VIRGINIA**, within 30 days to MaryBeth Murr at the address listed on the first page. Include a copy of this letter with your payment to ensure that your account is properly credited.

This letter summarizes the likelihood of the occurrence of endangered or threatened animal species at the project site. If you have additional questions in this regard, please contact me at (804) 367-8001. Please note that this response does not address any other environmental concerns; these issues are analyzed by our Environmental Services Section, in conjunction with interagency review of applications for state and federal permits. If you have any questions in this regard, please contact Brian Moyer at (804) 367-6913.

Please note that the data used to develop this response are continually updated. Therefore, if significant changes are made to your project or if the project has not begun within 6 months of receiving this letter, then the applicant should request a new review of our data.

The Fish and Wildlife Information Service, the system of databases used to provide the information in this letter, can now be accessed via the Internet! The Service currently provides access to current and comprehensive information about all of Virginia's fish and wildlife resources, including those listed as threatened, endangered, or special concern; colonial birds; waterfowl; trout streams; and all wildlife. Users can choose a geographic location and generate a report of species known or likely to occur around that point. From our main web page, at www.dgif.state.va.us, choose the hyperlink to "Wildlife", then "Wildlife Information & Mapping Services" and then "Wildlife Information Online Service". For more information, please contact Amy Martin, Online Service Coordinator, at (804) 367-2211.

Thank you for your interest in the wildlife resources of Virginia.

Sincerely,

W. Adam Phelps
Wildlife Biologist

cc: R.T. Fernald, VDGIF
Eric Davis, USFWS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

March 10, 2003

Mr. David Dischner
Science Applications International Corporation
22 Enterprise Parkway, Suite 200
Hampton, Virginia 23666

Re: Storm Water System Upgrades at
Langley Air Force Base, #2852
Hampton, Virginia

Dear Mr. Dischner:

The U.S. Fish and Wildlife Service (Service) has reviewed your February 11, 2003 request for information on Federally listed and proposed endangered and threatened species and designated critical habitat for the above referenced project. The following comments are provided under provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The proposed project is to upgrade the storm water system servicing the flight line area at Langley Air Force Base in Hampton, Virginia. Based on the project description and location, it appears that this project is not likely to adversely affect any Federally listed or proposed species or their designated critical habitat. Should project plans change, or if additional information on the distribution of listed or proposed species or critical habitat becomes available, this determination may be reconsidered.

If you have any questions or need further assistance, please contact Kerry Linehan of this office at (804) 693-6694, extension 127.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

APPENDIX B
PERMIT APPLICATION

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 1ST FIGHTER WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
159 SWEENEY BLVD SUITE 200
LANGLEY AFB VA 23665-2291

27 NOV 2002

Ms. Anhthu Nguyen
Virginia Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach VA 23462

CERTIFIED MAIL
RETURN RECEIPT
7001 1940 0006 8798 8985

Dear Ms. Nguyen

Langley Air Force Base is pleased to submit this request to obtain a major modification to our existing Virginia Pollutant Discharge Elimination System (VPDES) Individual Permit (number VA0083194) for storm water discharges related to industrial activity. This modification is required due to the substantial renovations to and relocation of our permitted outfall 007. On 11 October 2002, representatives from Langley AFB met with personnel from VDEQ and confirmed the need for this written request submission. The attached narrative provides the necessary background and project description to support our permit modification request.

We look forward to continuing our relationship with VDEQ and are fully cognizant of our role and responsibility as environmental stewards. If you have any questions concerning this information, please call Mr. Matthew Goss at (757) 764-1130.

Sincerely

STEPHEN J. MILLER, Colonel, USAF
Commander

Attachment:
Permit Modification Narrative

PERMIT MODIFICATION NARRATIVE
Renovations to Langley AFB permitted outfall 007

Project Purpose
The aircraft hangars and associated support buildings on Danforth Avenue are subject to flooding during storm events and elevated high tides. Several of the hangars in this area are being rebuilt to support the F/A-22 beddown. As a component of this rebuilding, Langley AFB is upgrading the storm sewer system servicing these hangars to eliminate the flooding that occurs in this area.

Existing Storm Sewer
The 69-acre drainage basin served by Langley AFB's permitted outfall 007 discharges through an existing 42-inch pipe. The invert elevation is –2.56 feet relative to the North Atlantic Vertical Datum of 1988 (NAVD88). The Mean Low Water elevation at outfall 007 is approximately –1.8 feet and the Mean High Water mark is approximately +0.5 feet relative to NAVD88. The low elevation of the outfall and the very low slope of the system makes the outfall, and much of the upstream storm sewer system, tidally surcharged. This tidal influence dramatically impedes the performance of the system.

Existing Effluent and Monitoring Requirements
Under the existing permit (VA0083194), Langley AFB is permitted to discharge storm water runoff from aircraft maintenance and bulk fuel storage activities. Langley AFB monitors three parameters at outfall 007 on a quarterly basis: flow, pH, and Total Organic Carbon (TOC).

Proposed Storm Sewer Design
The proposed design to alleviate the flooding in the hangar area along Danforth Avenue involves constructing a new storm drainage system that will be adequate to handle the 10-year 1-hour rain event. Additionally, the design proposes building a new pump station to discharge the collected runoff into the Back River. The new pump station will be built approximately 300 feet north of the existing outfall 007. The new storm sewer will convey all of the storm water generated along Danforth Avenue and the upper half of Andrews Street. Upon completion of this project, only the lower half of Andrews Street will discharge through the existing outfall 007. As shown on the plans (submitted to VDEQ at the 11 October 2002 meeting), the new pump station will discharge through a 40-foot wide flume composed of a riprap bottom and concrete sidewalls. At the end of the flume, the bank of the Back River will be reconstructed with a riprap armor designed to protect the bank from erosion during flume discharge.

Proposed Outfall Characteristics
Latitude: 37 05 02 N
Longitude: 76 20 24 W
The proposed outfall and associated pump station will be the discharge point for storm water associated with industrial activity generated along Danforth Avenue and the upper half of Andrews Street. The proposed design effectively diverts the entire industrial storm water currently discharged at outfall 007. Langley AFB requests VDEQ assign the same monitoring requirements to the proposed outfall as currently exist for outfall 007.

BASIC APPLICATION FORM

JOINT PERMIT APPLICATION FOR ACTIVITIES IN WATERS AND WETLANDS OF THE COMMONWEALTH OF VIRGINIA

PLEASE PRINT OR TYPE ALL ANSWERS:
If a question does not apply to your project please print N/A (not applicable) in the block or space provided. If additional space is needed, attach extra 8-1/2" x 11" sheets of paper. If you are unsure of a particular term, please refer to the definitions section.

1a. Applicant's name and complete address:
Mr., Mrs., Ms. (circle one)

First Fighter Wing (1FW)
Langley Air Force Base
159 Sweeney Blvd., Suite 200
Langley AFB, VA 23665-2291

Telephone numbers:
Home(A/C_____)_____
Work (A/C_____)_____

1b. Property Owner's name and complete address:
(if different from above)

Telephone numbers:
Home(A/C_____)_____
Work (A/C_____)_____

2. Authorized agent's name and complete address (if applicable):

Col Stephen J. Miller
1 FW/CC
159 Sweeney Boulevard, Suite 200
Langley AFB, VA 23665-2107

Telephone numbers:
Home(A/C_____)_____
Work (A/C 757)764-5321

3. Have you obtained a contractor for the project? __Yes X No If your answer is "yes" complete the remainder of this question and submit the Applicant's and Contractor's Acknowledgement Form on page 46 with your application.

Contractor's name and complete address:

Telephone numbers:
Home A/C_____)_____
Work (A/C_____)_____

4. List the name, address, and telephone number of the newspaper having general circulation in the area of the project. Failure to complete this question may delay Local and State processing.

Name and complete address:
The Daily Press
7505 Warwick Blvd.
Newport News, VA 23607

Telephone number:
(A/C757) 247-4800

5. Please give the name of the waterbody at the project site, the county or city the project is located in, and directions to the site:

Back River a tributary to Chesapeake Bay

located in Hampton, Virginia
County/City

Give descriptive directions to the project site from the nearest intersection of two state roads within that county or city and visible points of reference :

The project site (for the new pump station) is located approximately 100 feet east of the intersection of Andrews Street and Sijan Road on Langley Air Force Base in Hampton, Virginia.

IF THE PROJECT SITE IS LOCATED IN AN UNDEVELOPED SUBDIVISION OR PROPERTY, CLEARLY STAKE AND IDENTIFY PROPERTY LINES AND LOCATION OF PROPOSAL. A SUPPLEMENTAL MAP THAT SHOWS HOW THE PROPERTY IS TO BE DIVIDED SHOULD ALSO BE PROVIDED

6. State the project purpose and provide a brief description of the project:
The project consists of the construction of a new pump station and storm sewer system. The pump station/storm sewer system will collect the storm water inflow that presently exits from Outfall Structure No. 7 and outfall through a new concrete and riprap structure (See attached sketch for proposed outfall layout).

7. Please place a checkmark next to as many of the following that describe your project site:

X Tidal waters	X 100 year floodplain	___ Natural
___ Tidal wetlands	___ Lake or Pond	X Man-made
___ Nontidal waters	___ Mudflats	___ Unknown
___ Nontidal wetlands	X River	
___ Vegetated Shallows		

___ Other (explain - e.g. Intermittent stream, vernal pool, etc.)

8. Proposed use (check one):

_____ Private	_____ Community	_____ Commercial
_____ Industrial	X Government	

_____ Other (explain):

9. Will the project impact (flood, drain, excavate, dredge, fill, shade, etc.) wetlands ?
_____ Yes __X__ No _____ Uncertain

If your answer is "YES":

A. vegetated wetlands area(s) to be impacted?
tidal __N/A__ square feet nontidal __N/A__ square feet
B. nonvegetated tidal wetlands area(s) to be impacted? __N/A__ square feet

10. Will the project be located at the site of any historic property? (Note: historic properties include but are not limited to archeological sites, Civil War earthworks, graveyards, buildings, bridges, canals, etc.)
_____ Yes __X__ No If "Yes", please provide a map showing the location.

11. Have you previously contacted the Department of Historic Resources concerning this project?
__X__ Yes _____ No If "Yes", please provide the following information:

a. VDHR file number: In progress
b. Response date: _____
c. Type of response (no effect/no adverse effect, additional information requested, survey requested, further consultation needed): _____

12. Is your project located within a historic district? __X__ Yes _____ No _____ Uncertain
If "Yes", please indicate which district: Langley Field Historic District

13. Has a survey to locate archeological sites and/or historic structures been carried out on the property?
_____ Yes __X__ No If "Yes", please provide the following information:

a. Date of survey: _____
b. Name of firm: _____
c. Is there a report on file with the Virginia Department of Historic Resources? _____
d. Was any historic property located? _____

14. Have you previously had a site visit, applied to, or obtained a permit from any agency (Federal, State, or Local) for any portion of the project described in this application or any other project at the site?
__X__ Yes ___ No If your answer is "Yes", provide the following information: **(See Attachment 1)**

Name of Representative: _____

Agency	Activity	Application Number	Action Taken (check the appropriate box)
			___ Issued ___ Denied
			___ Withdrawn ___ Site Visit

Date Action taken _____

ATTACHMENT 1

BASIC APPLICATION FORM

JOINT PERMIT APPLICATION FOR ACTIVITIES IN
WATERS AND WETLANDS OF THE COMMONWEALTH OF VIRGINIA

14. Have you previously had a site visit, applied to, or obtained a permit from any agency (Federal, State, or Local) for any portion of the project described in this application or any other project at the site?
_X_ Yes ___ No If your answer is "Yes", provide the following information:

A meeting with the Virginia Department of Environmental Quality (VDEQ) was held on 11 October 2002 at Langley AFB. This meeting was held to discuss the Virginia Pollutant Discharge Elimination System (VPDES) permitting issues associated with constructing a new outfall structure to replace Langely's existing VPDES Outfall 007.

Ms. Anhthu Nguyen represented DEQ at this meeting and advised that Langley AFB would be required to submit a permit modification to permit outflow from the proposed outflow structure.

15. a) Has any work commenced or has any portion of the project for which you are seeking a permit been completed? _____ Yes __X__ No

b) Are you submitting this application at the direction of any state, local or federal agency? X Yes __ No If your answer to either question above is "YES", give details below stating when the work was completed, who performed the work, and which agency (if any) directed you to submit the application. (Please clearly differentiate on your application drawings that portion of the work which has been completed from that which is proposed.)

U.S. Army Corps of Engineers, Norfolk District
James P. Kendall
ATTN: CENAO-TS-EE
803 Front Street
Norfolk, Virginia 23510-1096

16. Approximately how long will it take to complete the project after all required permits have been issued? __12__ months

17. Approximate cost of the entire project (materials, labor, etc): $ 7,300,000 Approximate cost of only that portion of the project which affects State Waters (below mean low water in tidal areas or ordinary high water in nontidal areas): $ 30,000

18. List the name and complete mailing address of each adjacent property owner to the project.

Langley AFB fronts on the Southwest Branch and the Northwest Branch of the Back River. The Base is also bounded on the north by Kiln Creek and on the south by Tide Mill Creek. Subsequently, there are no adjacent property owners, other than the Commonwealth of Virginia.

19. List the name and complete mailing address of each waterfront property owner across the waterway from the project, if the water body is less than 500 feet wide. Also, if the project is within a cove, list the name and address of each property owner located on the cove.

N/A. River width at the project location is approximately 2000 feet.

20. All affected property owners must be notified of the proposed plans. If you do this yourself, it will assist us in processing your application. Have you discussed this project with all affected parties and had them sign an Adjacent Property Owner's Acknowledgement Form? _____ Yes __X__ No If your answer is yes, the acknowledgement forms must be included with this application.

21. Check the appendices below which apply to your project. NOTE: Applicable appendices must be completed and submitted with your application. If you are proposing multiple activities, you may submit one plan view drawing provided all the required information for each activity is included (e.g., if your proposal includes a pier, boathouse and dredging, you may show all activities on a single plan view drawing). A sample drawing for each activity is located in back of the corresponding appendix. Although the sample drawings are condensed so that the plan view, cross section, end view, and vicinity maps are all on one page, you do not hav to limit your drawings to one page. Drawings submitted need not be prepared by a professional draftsman.

LIST OF APPENDICES AND ADDENDA

____	Appendix A	Private Piers & Marginal Wharves
____	Appendix B	Boathouses
____	Appendix C	Marinas & Commercial Piers
____	Appendix D	Dolphins-Mooring Piles-Buoys Not Associated w/Piers
____	Appendix E	Boat Ramps
____	Appendix F	Bulkheads & Associated Backfill
____	Appendix G	Fill
X	Appendix H	Riprap & Associated Backfill
____	Appendix I	Marsh Toe Stabilization
____	Appendix J	Dredging/Mining/Excavating
____	Appendix K	Groins & Jetties
____	Appendix L	Breakwaters
____	Appendix M	Beach Nourishment
X	Appendix N	Intake - Outfall Structures
____	Appendix O	Stream Channel Modifications
____	Appendix P	Impoundments/Dams
____	Appendix Q	Utility Crossings
____	Appendix R	Road Crossings (Bridges-Tunnels-Culverts)
X	Addendum	Department of Environmental Quality Additional Requirements

PRIVACY ACT STATEMENT: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the joint permit application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary; but it may not be possible to evaluate the permit application or issue a permit if the information requested is not provided.

ALL APPLICANTS MUST SIGN BELOW I hereby apply for all necessary permits for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions. I certify that the information submitted in this application is true and accurate to the best of my knowledge.

APPLICANT'S SIGNATURE	Stephen J. Miller, Colonel APPLICANT'S NAME (PRINTED/TYPED)	25 Jan 03 DATE

REMINDER: BE SURE TO COMPLETE THE APPENDICES YOU CHECKED ABOVE AND SUBMIT WITH THE BASIC APPLICATION FORM (PAGES 3-7). MAIL ALL INFORMATION TO:

Virginia Marine Resources Commission
Habitat Management Division
P. O. Box 756
Newport News, Virginia 23607

AGENT CERTIFICATION OF AUTHORIZATION

I Col Stephen J. Miller hereby certify that I have authorized Mr. Bruce W. MacDonald to act on my
(APPLICANT'S NAME) (AGENT'S NAME)

behalf and take all actions necessary to the processing, issuance, and acceptance of this permit and any and all standard and special conditions attached.

We hereby certify that the information submitted in this application is true and accurate to the best of our knowledge.

APPLICANT'S SIGNATURE
Stephen J. Miller, Colonel, USAF

25 Jan 03
DATE

AGENT'S SIGNATURE
Mr. Bruce W. MacDonald, GM-14

2 Dec 2002
DATE

Completion of this form will allow the agent to sign all future application correspondence. Also, please provide the name(s) and complete address(es) of all legal property owner(s) as shown on your recorded deed.

APPENDIX H – RIPRAP REVETMENT & ASSOCIATED BACKFILL

PLEASE COMPLETE THE CHECKLIST AND ANSWER THE QUESTIONS. THE DRAWINGS MUST CONTAIN THE FOLLOWING INFORMATION OR THEY WILL BE RETURNED AS INCOMPLETE:

Plan View Drawing

- X north arrow
- X waterway name
- X existing structures
- X benchmarks showing distances to fixed points of reference
- X mean low water and mean high water lines (tidal)
- N/A ordinary high water line (nontidal)
- N/A location of vegetated wetlands at the project site
- X shoreline, property lines, and location of adjacent property owners
- X ebb and flood (tidal) or ~~direction of flow (nontidal)~~
- X channelward encroachment relative to mean high/mean low/ordinary high water lines
- X connection with existing bulkhead or riprap structures (if applicable)
- X proposed backfill
- X length of revetment

Cross Section Drawing

- X proposed backfill
- X mean high and mean low water levels (tidal)
- N/A ordinary high water (nontidal)
- X existing contours of the shoreline and/or bank
- X dimensions of proposed revetment
- X filter cloth
- X buried toe or riprap apron
- X proposed grading of existing bank relative to mean high/ordinary high water

X **Vicinity Map** The name of the map from which the vicinity map was taken and the exact location of the project site must be included (U.S.G.S. quad sheet, street map, or county map is preferred).

1. What will be the average amount of material (placed below the plane of mean high water or ordinary high water) per linear foot of shoreline? 16.3 cu.yd(s).per ft. OR _____ton(s) per ft.

2. What type of material will be used for construction of the riprap revetment (e.g. quarry stone, cinder blocks, etc.)?
   Quarry stone.

3. What will be the average weight of the: (See attached sketches)
   Core material (bottom layers) 300 pounds per stone
   Armor material (top 2 layers) 300 pounds per stone

4. If the revetment will be backfilled, describe the composition of the material to be used (e.g. 80% sand, 15% clay and 5% silt):
   N/A.

5. What is the source of the backfill material? N/A.

6. Will any portion of the project be placed on wetlands or subaqueous land? X Yes _____ No
   If your answer is yes, indicate the square footage and type of area(s) to be impacted:

	Tidal		Nontidal	
Vegetated wetlands	0	sf.	N/A	sf.
Non-vegetated wetlands	0	sf.	----------	
Subaqueous land	3930	sf.	N/A	sf.

THE DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIRES APPLICANTS TO SUBMIT THE ADDENDUM LOCATED AT THE END OF THIS APPLICATION

APPENDIX N -- ~~INTAKE~~ OUTFALL STRUCTURES

PLEASE COMPLETE THE CHECKLIST AND ANSWER THE QUESTIONS. THE DRAWINGS MUST CONTAIN THE FOLLOWING INFORMATION OR THEY WILL BE RETURNED AS INCOMPLETE:

Plan View Drawing

__X__ north arrow
__X__ waterway name
__X__ existing structures
__X__ dimensions of structure and benchmarks showing distances to fixed points of reference
__X__ mean low water and mean high water lines (tidal)
__N/A__ ordinary high water line (nontidal)
__N/A__ location of vegetated wetlands at the project site
__X__ shoreline, property lines, and location of adjacent property owners
__X__ ebb and flood (tidal) or ~~direction of flow (nontidal)~~
__X__ channelward encroachment relative to mean high/mean low/ordinary high water lines

Cross Section Drawing

__X__ existing contours of the bottom and banks
__X__ ~~intake~~ or outfall pipe
__X__ mean high and mean low water levels (tidal)
__N/A__ ordinary high water level (nontidal)
__X__ supporting structures
__X__ splash apron, if applicable
__X__ filter cloth

__X__ **~~Vicinity~~ Map** The name of the map from which the vicinity map was taken and the exact location of the project site must be included (U.S.G.S. quad sheet, street map, or county map is preferred).

1. Provide the following: type & size of pipe: __N/A__ ~~Intake~~ _____ Outfall **(See Attachment 2)**
   ~~Intakes~~: daily rate of withdrawal: __N/A__ mgd velocity: __N/A__ fps
   screen mesh size: __N/A__ inches _____ mm __N/A__ other (specify)
   Outfalls: daily rate of discharge: _____ mgd **(See Attachment 2)**

2. If discharge will be thermally enhanced, provide the maximum temperature. __N/S__

3. What is the average stream flow at the: ~~Intake site~~? __N/A__ cfs Outfall site? _____ cfs **(See Attachment 2)**

4. What measures are proposed to prevent bank erosion? Concrete and Riprap Apron Structure.
   (See Attachment 2 and attached sketches)

5. Will any structure (wingwalls, splash apron, etc.) impact ~~wetlands~~ or subaqueous land? __X__ Yes ___ No

   If your answer is yes, indicate the square footage and type of area(s) to be impacted:

	Tidal		Nontidal	
Vegetated wetlands	0	sf	N/A	sf
Non-vegetated wetlands	0	sf	----------	
Subaqueous land	3930	sf	N/A	sf

5. Can the entire structure or any part of it be placed landward of all wetlands? If no, please explain. **(See Attachment 2)**

6. What is the approximate drainage area and average stream flow? _____ square miles _____ cfs **(See Attachment 2)**

THE DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIRES APPLICANTS TO SUBMIT THE ADDENDUM LOCATED AT THE END OF THIS APPLICATION

ATTACHMENT 2
APPENDIX N – ~~INTAKE~~ OUTFALL STRUCTURES

1. Provide the following: type & size of pipe: _____ Outfall

   - The outfall structure will consist of a concrete flume that transitions into a riprap flume. The structure will include concrete wingwalls to control the outflow from the pump station. See attached sketches for plan and section.

   Outfalls: daily rate of discharge: _____ mgd

   - The discharge rate will vary with the size and magnitude of rainfall event (the structure provides outflow for storm water drainage that currently exits at VPDES Outfall 007). The design parameters for this project were a 10-year, 1-hour intensity that yielded an outflow of approximately 0.65 million gallons per day (mgd). This outflow will occur only during significant storm events. Daily outflows will vary with storm event and will be zero when no storm activity is present.

3. What is the average stream flow at the: Outfall site? _____ cfs

   - The Back River is a tidal body of water approximately 2000 feet wide at the project location. The average stream flow is assumed to vary from 20,000 to 30,000 cfs depending upon tidal and atmospheric conditions.

4. What measures are proposed to prevent bank erosion?_____

   - The outfall structure will consist of a concrete flume which transitions into a riprap flume. The riprap structure will tie into the existing riprap at the proposed site. The riprap structure will extend to the toe of the existing slope that coincides with the toe of the existing riprap.

5. Can the entire structure or any part of it be placed landward of all wetlands? If no, please explain.

   - Per the report entitled Final Wetland Report, Langley Air Force Base, Commonwealth of Virginia, April 2001, prepared by IT Corporation, there are no wetlands at the proposed pump station/ outflow location.

6. What is the approximate drainage area and average stream flow? _____ square miles _____cfs

   - The drainage area for the Southwest Branch of the Back River is approximately 12 square miles. See Item 3 for the average stream flow.

ADDENDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY ADDITIONAL INFORMATION FOR VIRGINIA WATER PROTECTION PERMITS

1. Provide the latitude and longitude at the center of the project and a U.S.G.S. topographic map of the project location.

Latitude 37 - 05 - 03 N
Longitude 76 - 20 - 25 W

Topographic map name: Hampton Quadrangle

2. Provide the eight digit Hydrologic Unit Code (HUC) for the project site and proposed mitigation site (if different). The HUC is defined by the Hydrologic Unit Map of the United States (U.S.G.S 1980).

Project HUC 02080208 Mitigation HUC N/A

3. Provide the Stream Classification pursuant to Virginia's Water Quality Standards (9 VAC 25-260-50) for surface waters which will be impacted by the project.

___ Class I - Open Ocean
___ Class III - Nontidal Waters
___ Class V - Stockable Trout Waters
___ Class VII - Wetlands
_X_ Class II - Estuarine Waters
___ Class IV - Mountainous Zone Waters
___ Class VI - Natural Trout Waters

4. Stream Drainage Area (check whichever applies)

A. ___ <1 square mile B.___ <5 square miles C. _X_ >5 square miles

5. Functional values assessments (wetlands only): **(See Attachment 3)**

For all projects impacting one acre or more of wetlands, a functional values assessment is required. We suggest that a functional assessment method be selected based upon its ease of use, ability to provide quality information, and utility in the field. The functional assessment and the methodology utilized to determine functional value(s) must be submitted with the application package.

6. Wetland delineation (where applicable): **(See Attachment 3)**

A. All projects impacting wetlands must provide a delineation map showing the physical location and aerial extent of all wetlands on the site. All data sheets and calculations utilized to determine an area's wetland status will be submitted with the delineation map. The currently accepted federal methodology will be used in preparing wetland delineations. The wetland delineation verification from the U.S. Army Corps of Engineers must be included with the application package, if available.

ATTACHMENT 3

DEPARTMENT OF ENVIRONMENTAL QUALITY ADDITIONAL INFORMATION FOR VIRGINIA WATER PROTECTION PERMITS

This project entails construction of a new pumped, storm sewer system. The existing outfall (VPDES Outfall 007) is the location where the present storm drainage exits to the Back River. This project will re-route the storm drainage to a new pump station (see attached sketches) and will effectively abandon the original outfall.

A meeting was held on 11 Oct 2002 at Langley AFB between the owner and VDEQ (Ms. Anhthu Nguyen). At this meeting, Ms. Nguyen indicated that this project would require a modification to the existing VPDES permit to allow discharge of the storm drainage at the proposed new pump station location.

Note: Appendix N – INTAKE-OUTFALL STRUCTURES was included to adequately describe the proposed pump station and outfall structure. This project does not entail water withdrawal or hydropower activity.

5. Functional values assessments (wetlands only):

   A. A wetlands delineation has been perfomed for Langley AFB (LAFB) and it has been determined that there are no wetlands at the proposed site. Reference is made to the Langley AFB report entitled FINAL WETLAND REPORT, LANGLEY AIR FORCE BASE, COMMONWEALTH OF VIRGINIA (dated April 2001) prepared by IT Corporation of Trenton, New Jersey.

6. Wetland delineation (where applicable):

   A. See response to item 5.

7. Mitigation Plan (required for unavoidable wetland losses and stream modifications):

   A. No mitigation plan is proposed since is has been determined that there are no wetlands at the proposed site.

8. Through 16. Not applicable.

B. The applicant should provide any available information regarding threatened or endangered species and special aquatic sites located on the proposed project site. Pursuant to the Code of Virginia 29.1-564: "Taking, transportation, sale, etc., of endangered species is prohibited. The taking, transportation, processing, sale or offer for sale within the Commonwealth of any fish or wildlife appearing on any list of threatened or endangered species published by the U.S. Secretary of the Interior pursuant to the provisions of the federal Endangered Species Act of 1973 (P.L. 93-205), or any modifications or amendments thereto, is prohibited except as provided in 29.1-568."

7. Mitigation Plan (required for unavoidable wetland losses and stream modifications): **Important: The Virginia Water Protection Permit Regulation (9 VAC 25-210-90) requires that the permittee take all reasonable steps to avoid all adverse environmental impacts to State waters, including wetlands.**
(See Attachment 3)

A. The mitigation plan will at a minimum include:

1. Measures taken to avoid impacts to surface waters, including wetlands, to the maximum extent practicable.

2. Where impacts could not be avoided, measures taken to reduce impacts to surface waters, including wetlands.

3. Where impacts could not be avoided or minimized, a mitigation plan which completely describes the type of impact to be mitigated and the means by which mitigation will be accomplished.

A mitigation plan which includes wetland creation and/or stream restoration should provide the following information:

a. Wetland creation:
- Mitigation goals in terms of functions and values (acres of wetlands, vegetation type, etc.);
- Location map - topographic map, including latitude and longitude at the center of each mitigation site;
- Source of hydrology, and Water budget for both a "typical" and a "dry" year for each mitigation site;
- Conceptual grading plan, showing existing and proposed grade;
- Plant species list and planting scheme, including expected zonation;
- Soil preparation and amendments;
- Surrounding land use/plans, including probable future land use, if available;
- Abatement/control plan for invasive plants and animal species;
- Schedule for mitigation construction/restoration;
- And all structures and features considered necessary for the success of the plan.

b. Stream restoration:
   - Information regarding on-site stream restoration opportunity;
   - Location map - topographic map or plan drawing which depicts stream sections to be restored;
   - Identify proposed stream restoration activities for each section (i.e., riparian plantings, bank stabilization, etc.);
   - Plant species list and planting scheme (including plant sizes and spacings);
   - and identification of proposed construction habitat structures(i.e., riffles, pools, k-dams, etc.), location and function in terms if existing or "recruit" of specific organism which will inhabit such structures.

B. If no mitigation is planned, a brief statement to this effect and a detailed explanation as to the reason no replacement mitigation is planned must be submitted.

Projects involving a water withdrawal or a FERC hydropower licensing or relicensing are required to provide the information in items 8 through 16.

8. Appendix N - Stream Intakes and Outfall Structures, Appendix 0 - Stream Channel Modifications and /or Appendix P - Impoundments/Dams, must be completed as appropriate. **(Not applicable)**

9. Provide the median monthly stream flows in cubic feet per second (cfs) at the water intake or dam site. **(Not applicable)**

Month	Median Flow (cfs)	Month	Median Flow (cfs)
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	

10. Describe below or on an attachment the stream flow gauges, the type of calculations used and the period of record that was used to calculate the median monthly flows in item 9, and the average flows provided in Appendices N, O, and P. **(Not applicable)**

11. Provide the maxim[illegible] instantaneous withdrawal and ma[illegible].um daily withdrawal at the water intake or dam site. Specify the units of measurement, i.e., million gallons per day, gallons per minute, cubic feet per second, etc. **(Not applicable)**

Maximum instantaneous withdrawal_____

Maximum daily withdrawal _____

12. Describe the manner in which the withdrawal of water varies over time, for example, as a function of the time of year, or time of day, or time of week. **(Not applicable)**

_____

_____

_____

_____

13. Describe below the amount of water that will be lost to consumptive use. For the purpose of this application, consumptive use means the withdrawal of surface waters without recycle of said waters to their source or basin of origin. Attach a map showing the location of the withdrawal and location of the return of flow. **(Not applicable)**

_____

_____

_____

_____

14. Describe below or in a separate attachment how the amount of water to be withdrawn was calculated and relevant assumptions made in that calculation. Also, describe the proposed use of the water withdrawal. **(Not applicable)**

_____

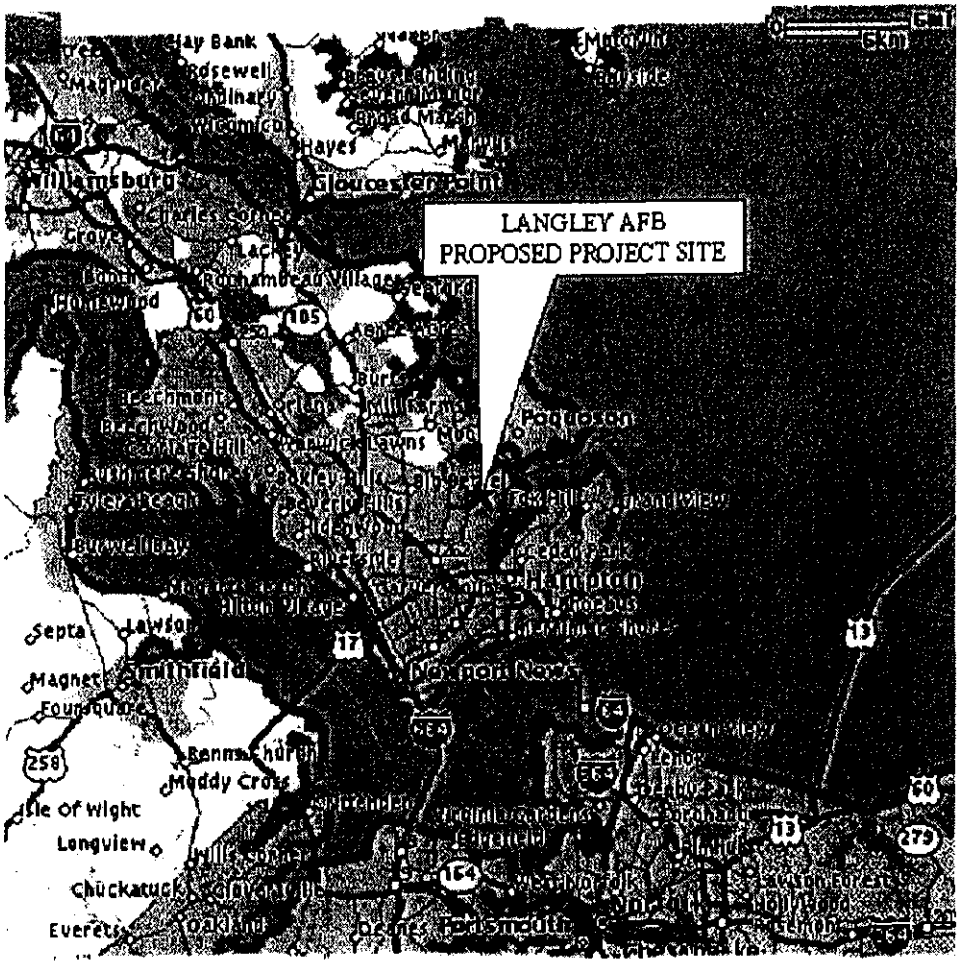
_____

_____

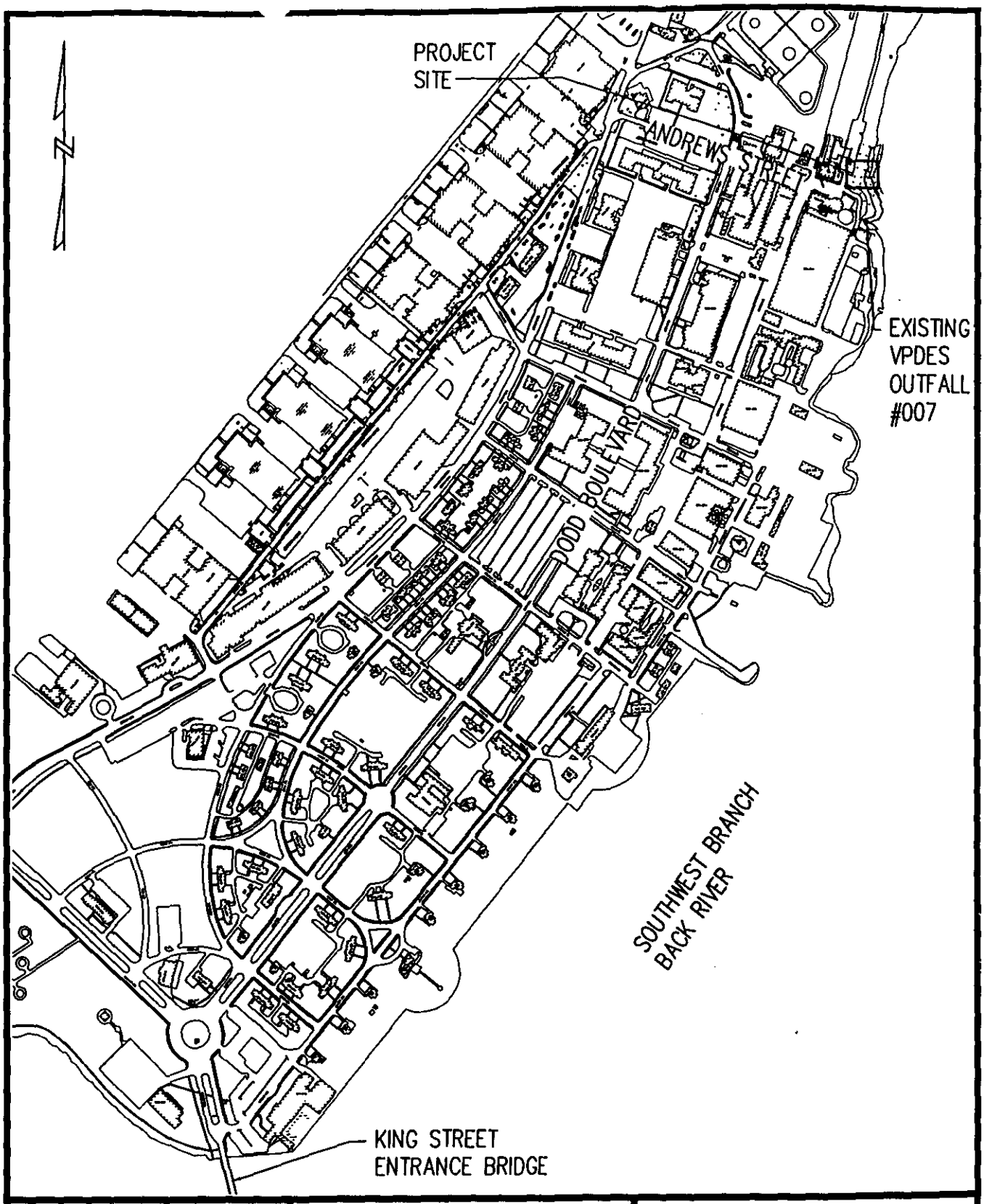
_____

15. Describe in an attachment the existing beneficial uses of the surface water body near the proposed project site that would be affected by the withdrawal of water. Include both instream and offstream uses. For the purposes of this application beneficial instream uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation and cultural and aesthetic values. Offstream beneficial uses include, but are not limited to, domestic (including public water supply), agricultural, hydropower, commercial and industrial uses. Describe the stream flow necessary to protect existing beneficial uses and how the proposed withdrawal will impact existing beneficial uses. **(Not applicable)**

16. Describe in an attachment the aquatic life known to be present at the proposed location that will be impacted by the proposed withdrawal. Include information on the species known to be present and their habitat requirements. **(Not applicable)**



ADJACENT PROPERTY OWNERS	VICINITY MAP	PROPOSED STORM SEWER SYSTEM
1. N/A	F-22 INFRASTRUCTURE AND UTILITIES UPGRADE SEWER SYSTEM	BACK RIVER
2.		HAMPTON, VA.
3.		APPLICANT LANGLEY AFB
4.	SCALE: AS SHOWN	SHEET 1 OF 4 DATE 10/30/02
5.		



ADJACENT PROPERTY OWNERS

1. N/A
2.
3.
4.
5.

SITE MAP

F-22 INFRASTRUCTURE AND UTILITIES UPGRADE SEWER SYSTEM

SCALE: 1" =600'

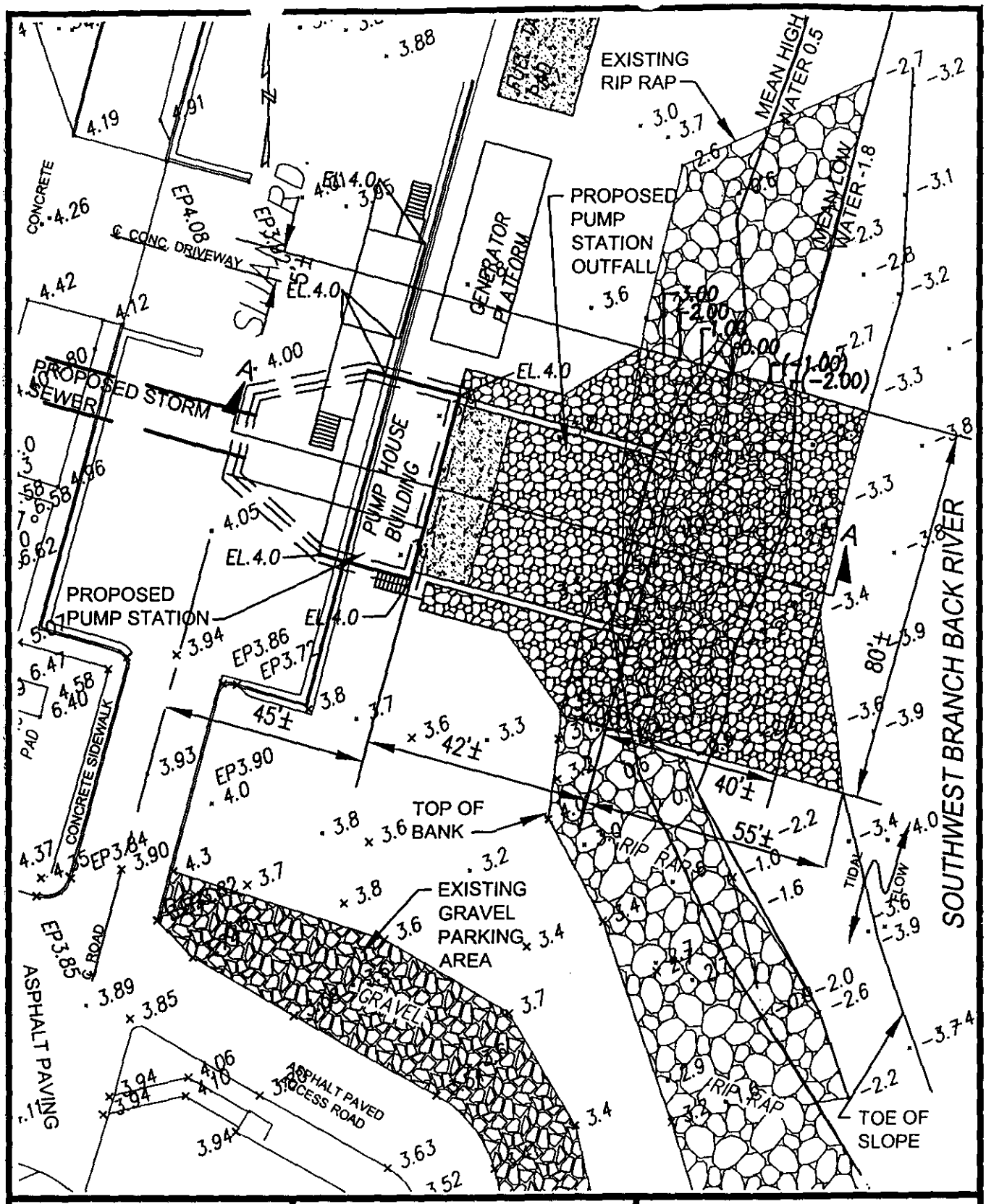
PROPOSED STORM SEWER SYSTEM

BACK RIVER

HAMPTON, VA.

APPLICANT LANGLEY AFB

SHEET 2 OF 4 DATE 10/30/02



ADJACENT PROPERTY OWNERS

1. N/A
2.
3.
4.
5.

PLAN OF PROPOSED OUTFALL

F-22 INFRASTRUCTURE AND UTLITIES UPGRADE SEWER SYSTEM

SCALE: 1"=30'

PROPOSED STORM SEWER SYSTEM

BACK RIVER

HAMPTON, VA.

APPLICANT LANGLEY AFB

SHEET 3 OF 4 DATE 10/30/02

ADJACENT PROPERTY OWNERS

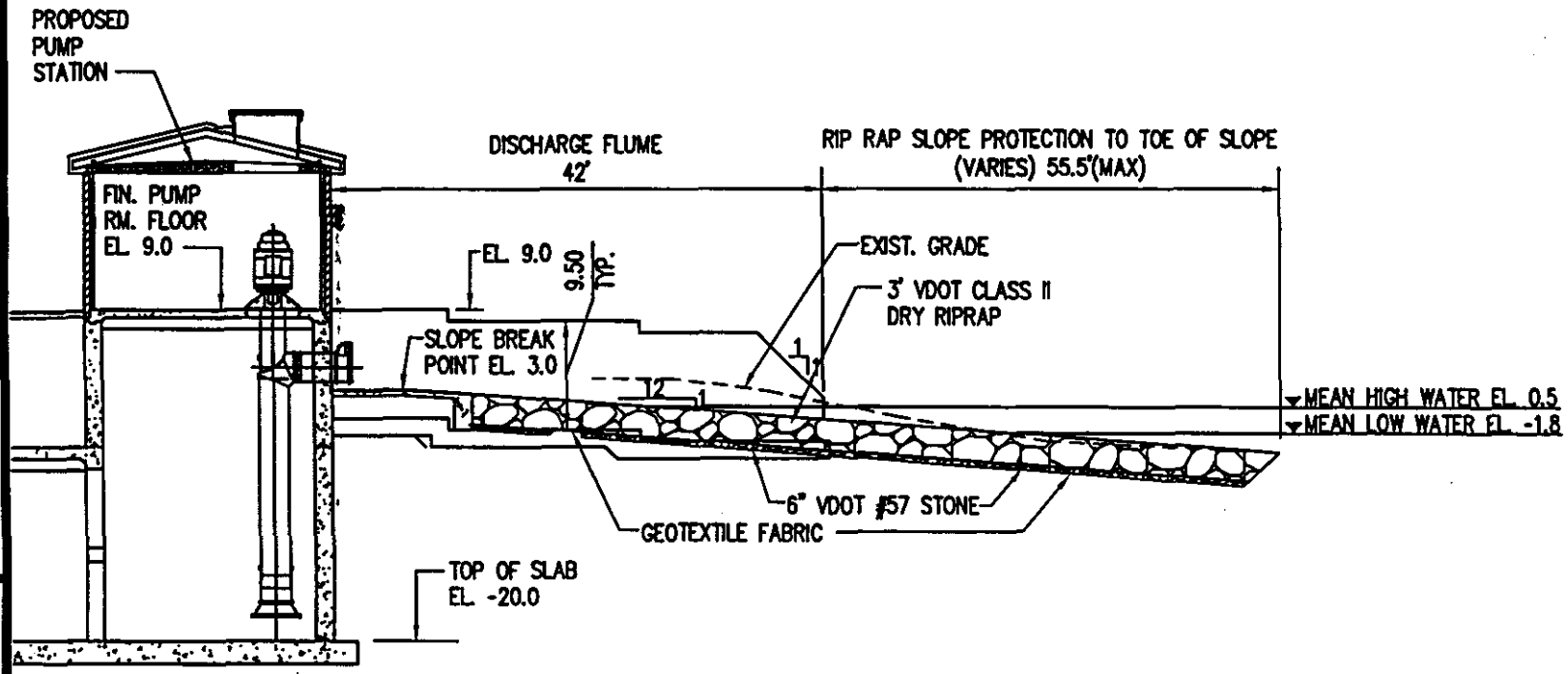
1. N/A
2.
3.
4.
5.

CROSS SECTION AT PROPOSED OUTFALL

F-22 INFRASTRUCTURE AND UTILITIES
UPGRADE SEWER SYSTEM

SCALE: NOT TO SCALE

PROPOSED STORM SEWER SYSTEM
BACK RIVER
HAMPTON, VA.
APPLICANT LANGLEY AFB
SHEET 4 OF 4
DATE 10/30/02



SECTION A-A